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THE UNIVERSITY OF ALBERTA

PARALLEL PROCESSES IN THE READING AND WRITING OF SIXTH-GRADERS

by

DEBRA JEAN ANDERSON

A THESIS
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF EDUCATION

DEPARTMENT OF ELEMENTARY EDUCATION

EDMONTON, ALBERTA
SPRING, 1989

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ISBN 0-315-52887-7

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September 28, 1988

Dr. Linda Flower
Center for the Study of Writing
Carnegie - Mellon University
160 Barker Hall
Pittsburgh,PA 15213

Dear Dr. Flower:

I wish to request permission to reproduce Figure 1: A Conceptual Model for Discourse Construction from page 2 of your engaging Occasional Paper No. 1, "Interpretive Acts: Cognition and the Construction of Discourse."

I find this Figure and your discussion to be essentially related to my thesis: Strategies Linking the Reading and Writing Processes of Sixth Graders. As a Masters student at the University of Alberta, I have been comparing introspective and retrospective protocols obtained during reading and writing sessions. I hope to support Robert Tierney's model which parallels the reading and writing processes, and which is based upon your model of the Structure of the Writing Process. I hope you will also grant permission to use this model.

I will gladly supply any further information that you may require.

Thank you for your consideration.

Sincerely,

D. Anderson
Debra Anderson

Certainly

It would be best to cite the Poetics published reference. Good luck on your work

Linda

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DATED April 21, 1989

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "Parallel Processes in the Reading and Writing of Sixth-Graders" submitted by Debra Jean Anderson in partial fulfillment of the requirements for the degree of Master of Education.

Grace Malicky

Supervisor

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William Fagan

Date April 19, 1989

ABSTRACT

This study was designed to examine the cognitive processes involved in reading and writing for evidence of parallels between the two. Subjects were eight sixth-grade students who achieved at or above the 80th percentile on Edmonton Public School Board's Elementary Reading Survey Test: Grade Five, and who were judged to be good readers and writers by their teachers. They were each asked to think aloud while reading a ghost story and while writing their own story. In addition to the introspective protocols, retrospective protocols were obtained by asking subjects to review their thinking after completing a story. Subjects were then interviewed about their processing. Instructions and interview questions were kept parallel to allow for comparisons between the reading and writing data collected. The audiotaped think-aloud protocols were transcribed, divided into clausal units, and catagorized as one of fourteen processes defined in terms of the Planning, Refining, and Reviewing processes of Tierney's model paralleling reading and writing.

Each subject's percentage of protocols per process was calculated and compared to group means using standard deviation as an indicator of difference. Reading and writing patterns were compared for each subject as well as for the group. Processing styles were also described qualitatively through an examination of protocol sequences. Interview data were used to verify and extend findings of protocol analysis.

Informal interviews with subjects as well as with teachers about their participating students, together with a survey of subjects' journals and cumulative files, were used to develop subject profiles and to evaluate the validity of each subject's performance in the study. Interviews with the grade six teachers about their Language Arts programs, as well as observations of actual lessons, provided further contextual data.

Six of the eight subjects used similar approaches to both reading and writing. The three styles that emerged were defined as Inquiring, Interpretive and Predictive. The group used Planning and Refining processes much more than Reviewing processes, reflecting the emphasis of observed Language Arts lessons. The subjects emphasized Planning during writing, and Refining a model of meaning during reading. As readers, they did less goal-directing and revising, but made more affective responses, than they did as writers. There was evidence that some reading processes were more automatic than the parallel writing processes. Subjects claimed to use similar problem-solving strategies for the two activities. Both reading and writing precipitated surprises and discoveries, though in this study reading appeared to encourage accommodations to existing

schema while connections between schema were made during writing. In addition to facilitating efficient transfer of learning between reading and writing, it may be that the process approach to teaching the Language Arts in parallel would help students to be more aware of the goals they set and revisions that should be made while reading, as well as to help promote writing as an aesthetic experience.

ACKNOWLEDGEMENTS

It is with much appreciation that the author acknowledges the contributions of her Supervisor, Dr. Grace Malicky, to the completion of this study. In refining the design, in defining process categories, in the approach to quantitative analysis, and in the final organization and editing of the manuscript, Dr. Malicky's practical direction was of great assistance. Her challenges to be convincing lead to some important re-thinking. She was patient and encouraging even while this research was set aside to establish my career.

Appreciation is also extended to the committee members for reading and giving their critiques of the study. Dr. Margaret Iveson provided constructive and editorial insights based on her expertise in the writing field. Dr. William Fagan's challenges on theoretical points and his experience with protocol analysis in the reading field were valuable as well. Both were of great assistance in improving the precision with which the findings of the study were interpreted and reported.

The writer wishes to acknowledge the Edmonton Public School Board for allowing this research to be done in one of its schools. The principal involved was most cooperative. Gratitude is extended to the two grade 6 teachers of that school for permitting me to disrupt their routines for a month, for giving freely of their time for interviews, for providing scholarly comment, and for allowing observation of their lessons. Foremost, I wish to acknowledge and thank the 12 members of the 1983-84 grade 6 classes who missed lessons in order to participate in the study, and who shared their thoughts so openly.

Mrs. Kathy Wallace, an elementary teacher and colleague, deserves much credit for giving up several of her summer days (much-cherished in the North) to serve as a rater in establishing inter-rater reliability of the process categories. Thanks goes as well to Pat Pier of the Herbert Coutt's Library for providing neglected reference information.

Finally, I am grateful to my husband, Jeff, for accepting the disruptions of normal routine and social activities, especially during the final months of writing. He gave support and encouragement whenever my confidence was low.

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CHAPTER 1

OVERVIEW

Few teachers have not heard a young writer exclaim, "This doesn't sound right!" nor a young reader similarly lament, "I don't understand this." In both instances, readers and writers are grappling with "making sense"--composing or reconstructing meaning--and they may resort to some similar strategies such as rereading for reorientation, relating ideas in new combinations, or asking for a second opinion. Several instances have been reported where children learning the writing process have substantially improved their reading comprehension (Smith, J., 1982; Murray & Graves, 1981). Lamme and Childers (1983) observed three young children who did a great deal of reading while composing, and concluded that writing may be "more central to learning to read than has been recognized in past reading research" (p. 49). While it seems logical that similarities between processing in reading and writing would account for these observations, and while theoretical frameworks for such relationships have been hypothesized, the empirical evidence is yet scanty.

Purpose of the Study

The purpose of this study was to analyze the think-aloud protocols of good sixth grade readers/writers for evidence of similarity between reading and writing in the cognitive processes used. It was hoped that this study would promote dialogue between reading and writing specialists toward a common theoretical framework for the cognitive processing involved in literacy.

Background of the Study

The connection between reading and writing has been conceptualized in several ways. One group of researchers has attempted to show that the similarities between reading and writing lie in the medium of written language that they share. In Marie Clay's (1975) study of early literacy, preschoolers appeared to develop concepts of print such as order, direction and spelling through writing. Another group has studied the correlation between the quality of reading and writing products. For example, comprehension levels in reading have been compared to sentence complexity and length of T-units in writing. Some researchers have attemped to effect improvement in reading skills through writing instruction, or vice versa. Yet another group sees the connection as the communication which readers and writers strive to achieve with one another.

Several authors have hypothesized that the similarities between reading and writing lie in the cognitive processes that are used for each. Petrosky (1982) wrote:

> . . . I think there is compelling evidence to support the claim that comprehension is heavily subjective and is a function of the reader's prior knowledge, the text, and the context. I also think we can argue that we compose as we comprehend, and that our composition arises from these same factors: the text, our affective and cognitive frameworks (or prior knowledge), and the context for reading. When we put together our comprehension--however consciously or unconsciously--the "putting together" is more an act of composition than of information retrieval (p. 21).

Moffett (1983) claims that reading and writing both modify the inner stream--they "temporarily change how we talk to ourselves" (p. 315). His explanation of the writing process is particularly insightful:

> Composing connects. The bits and pieces of thought, memory, feeling, and imagery lie within already, it's true, but old habits keep turning these over in the same patterns or simply ignoring them. . . . the act of composing necessarily rearranges our store of inner material (p. 320).

Certainly it can be recognized in this what the reader must do with his/her own "bits and pieces" and "old patterns" as he/she re-composes the author's meaning.

Tierney, LaZansky, Raphael, and Cohen (1983) provide some evidence for the idea that reading and writing both involve composing. They investigated the aspect of negotiation in a situation where writers described how to assemble a toy pump to their readers. Subjects were asked to think aloud--or introspect--as they wrote or read the directions. "Readers were frequently critical of a writer's work, including the writer's choice of words, clarity, and accuracy," and they inferred information in order to make the directions more "explicit" (p. 24). The researchers concluded that "while a successful reader responds reflexively and actively to writers, he does his own meaning making, engaging in a transaction with himself as the writer" (p. 25).

Flower and Hayes (1981) analyzed the introspective talk-alouds of writers in order to develop a cognitive process model of writing. Tierney (1983) argues convincingly that this model of writing may be used to describe reading. It is his model of the reading process, considered together with the Flower and Hayes model, that provided a framework for the present study.

Categorization of introspective and retrospective protocols in terms relative to cognitive processing has been done in both the reading and writing fields. However, the results of these studies are not directly comparable because of the different age levels used and the variability in the terminology used to describe processes.

The present study combined thinking aloud with retrospective interview. The think-alouds of each subject were analyzed for composing processes--for evidence that the Flower and Hayes' model of writing also applies to reading, as Tierney proposed. Rather than investigate the aspect of negotiation between a reader paired with a writer, as Tierney et al. (1983) did, this study attempted to elucidate the cognitive processes of composing common to the reading and writing of each subject. Thus, the design resembled that of a study done by Langer (1984).

This thought-provoking point by Murray (1982) was borne in mind throughout the study:

> . . . the act of writing is inseparable from the act of reading. You can read without writing, but you can't write without reading. The reading skills required, however, to decode someone else's finished text may be quite different from the reading skills required to chase a wisp of thinking until it grows into a completed thought (p. 141).

Research Questions

The following questions guided this study.

1. What processes have good readers/writers in this study developed by grade six
   a. for reading?
   b. for writing?

2. Are certain processes more likely than others to be common to both reading and writing in sixth grade subjects? If so, what are these processes?

3. Are processing styles indicated by differences between subjects in their approaches to reading and writing?

4. What do sixth graders perceive to be similar and different about their thinking for reading and writing activities?

Definition of Terms

Writing: "the process of using language to discover meaning in experience and to communicate it" (Murray, 1978, p. 86).

Reading: The active construction of personal meaning for an author's message.

Composing: Meaning-making--whether it be writing one's own message or reconstructing another's--based on the interaction of one's goals, prior knowledge, and text.

Process: The cognitive-linguistic activity that underlies the generation of a protocol (eg. the predicting process as inferred to underlie a statement about what will happen next).

Think-alouds: Protocols that result from asking subjects to think aloud as they read and write.

Assumptions and Delimitations

1. It was assumed that subjects' think-alouds represented their approaches to reading and writing. In actuality, thinking aloud for the researcher may have altered normal strategy use either by interfering with it or by increasing it.

2. The study was limited by the small sample of eight subjects; hypotheses, but no generalizations, may be made about processing at the grade six level.

3. Grade six subjects were studied since they were more likely than younger subjects to be able to verbalize amply about their strategies, and to be competent in decoding and in the mechanics of writing. For the same reasons, only good readers and writers were studied.

4. Only the reading and writing of narrative texts were studied since subjects would have had more

instructional experience with narratives than with expository texts.

Significance of the Study

An unveiling of the cognitive processes that are common to both reading and writing would be useful in further guiding the teacher of a "whole language" or integrated Language Arts program. It would also justify more integrated approaches to remedial reading and suggest new techniques that can be used with those for whom reading instruction has failed. Out of such research new techniques may also emerge for diagnosis of writing processes, particularly as they relate to reading.

CHAPTER 2

A REVIEW OF THE LITERATURE

> A word devoid of thought is a dead thing, and a thought unembodied in words remains a shadow (Vygotsky, 1962, p. 153).

Connecting Reading and Writing

Traditionally, the processes of reading and writing have been studied separately, but researchers have recently been impassioned by the reading-writing connection. This "connection" has been variously conceptualized. Some see the surface feature of print as the common pivot point. A few have investigated the correlation of reading comprehension scores with the quality or other aspects of written products. Others connect reading and writing by using one process as a supplementary activity in the teaching of the other. A growing number interpret the connection as an act of communication that binds reader and writer in a transaction through print.

These four avenues of study will be briefly illustrated through examples of research. A fifth avenue of research--that of the current study--is then presented. It examines the contention that reading and writing are essentially connected through similarities--if not a parallel--in cognitive-linguistic processing.

Concepts of Print

A number of authors consider reading and writing to be mutually beneficial to the young child who is just beginning to tackle the puzzle of print. Gifted and natural readers have been observed to explore the conventions of print through the activity of writing (Clark, 1976; Dyson, 1982). A third of the "gifted" fluent readers observed by Clark (1976) had become interested in writing before the age of four. They copied letters and words, wrote their names, and some even composed short messages. In Marie Clay's (1975) study of early literacy, preschoolers appeared to develop concepts of print--such as order, direction and spelling--through writing. Clay suggests that "practice in writing could be critical at an early learning stage and of much less value for reading progress once the basic scanning and memory strategies were established" (p. 71).

Charting the developmental link between reading and writing throughout the grade levels tends to indicate otherwise. Using a process-conference approach to writing, kindergarten children read, copied, generated new ideas from trade books, and included characters from them in their own stories (Furniss, 1983). Eckoff (1983) showed that the writing of grade two children reflected the style and structure of their basal readers. Shanahan (1982) and Chall and Jacobs (1983) showed that the basis for the relationship between reading and writing from grades two to seven appears to change developmentally from the word level (eg. word identification and spelling) to the discourse level (eg. comprehension in reading and organization in writing). Kane (1983) followed 42 subjects from first grade through grade three. She was able to show that syntactic complexity in writing grew with reading comprehension. Shuy (1981) and Graves (1983) also offer support for these developmental shifts.

Correlational Studies

Early in his thirteen-year longitudinal study, Loban (1976) found that most good readers were good writers and most poor readers were poor writers. A large body of research studying the connection between reading and writing has attempted to prove that there is one by correlating measures of reading comprehension with measures of writing proficiency. Vocabulary and comprehension levels in reading have been compared to sentence complexity, length of T-units and holistic evaluations of quality in writing.

Shanahan (1982) did one of the more comprehensive studies of this kind. He used the cloze procedure and standardized measures of vocabulary, word recognition, sentence comprehension and passage comprehension to obtain reading data from 256 second graders and 251 fifth graders. To obtain writing data, he analyzed spelling tests for phonemic and visual accuracy. As well, two stories written by each subject were analyzed for mean length of T-units, vocabulary diversity and use of story grammar elements. His analysis of the interaction between these variables showed that word analysis correlated well with spelling, as spelling did with reading vocabulary; reading vocabulary was related to vocabulary diversity in writing; and comprehension was related to written syntax. On the other hand, comprehension was not found to be significantly related to story structure; neither was syntax found to be related to reading comprehension (at grade five level), and nor did spelling relate to reading vocabulary (at grade two level).

Sampling 50 sixth-graders, Ledford (1984) also studied the interaction of a number of variables including gender, ethnic background, socio-economic level, reading schemata, reading achievement and writing sophistication. Of most interest here, she did find a significant relationship between reading achievement and use of mechanics, adjectives, adverbs, comparative references, conjunctions, lexical cohesion and total number of words in writing.

Spivey (1984) asked 40 able and less able adult readers to select content from three informational texts to synthesize into one of their own. More able comprehenders selected information of greater importance than did less able comprehenders, and also produced compositions of higher overall quality and with better organization and connectivity.

Stotsky (1983), Larsen (1984), and Belanger (1987) have reviewed more than 40 correlational studies, most of which indicate a definite relationship between reading and writing ability. A few of these, though, do indicate that perhaps 20% of subjects have significantly more ability in one process than in the other (Belanger, 1978; Tierney and Leys, 1984). Belanger (1987) included a cautionary note: correlations provide no basis for identifying the nature of the relationship between reading and writing in terms of underlying cognition.

Reading to Write, Writing to Read: Effects of Instruction

Numerous experimental investigations have been conducted into the effects of instruction in one process on measurable gains in the other. These studies have produced data for the primary grades through college and are reviewed by Stotsky (1983), Larsen (1984), and Belanger (1987).

One project provides an example of reading instruction being related to improved writing skills. In her descriptive study of thirteen college freshmen enrolled in a basic skills course, Reagan (1984) found a positive change qualitatively and statistically in writing proficiency after a semester of combined reading-writing instruction. She lists motivation and instructor's role among possible influences on the results. It seems that her interest as observer, interviewer, and recorder might also have influenced the attitudes and therefore the gains made by participating subjects.

Research studies into the effects of writing instruction on reading comprehension are more numerous. A number of investigators have been interested in generative writing tasks or "writing to learn". Doctorow, Wittrock and Marks (1978) doubled the comprehension of sixth graders by teaching them to insert paragraph headings and to generate sentences about paragraphs. Hall (1984) had remedial college sudents "role-play" an author by writing about their related experiences and knowledge in preparation for reading a selection. The experimental group made significant gains compared to the control group on a measure of critical reading skills.

Kelley (1984) used a sample of 154 sixth graders to examine the effects of two types of writing instruction--a skills approach and a six-step process approach--on reading comprehension and narrative writing. A control group read silently instead of receiving the 23 forty-minute writing lessons. Both experimental groups made significant gains in reading and writing as compared to the control group.

Hayes and Copeland (1982) conducted an experiment with 52 ninth graders who each read four passages but was assigned either to a matching exercise (control group) or to a writing task (paragraphing, comparing-contrasting, or formulating questions). They concluded that the writing tasks induced greater inference production than did the matching task, perhaps because they "extend the thinking involved in probing for the discovery of promising relations in the solution of abstract problems" (p. 12).

In her study of secondary students, Harrington (1987) successfully used two methods of writing instruction to strengthen use of schema and inference in reading and writing, and thus to develop thinking and problem-solving skills.

Such research which shows a positive gain in one process through instruction in the other has been in no way conclusive. Belanger (1978) studied 194 ninth and tenth grade students. The experimental group made significant gains in reading after the one-year reading instruction treatment, but Belanger found no effect on writing ability as measured by quality, syntactic density, T-unit length, and fluency (the number of words per composition).

Similarly, Ferris and Snyder (1986) set out to test a claim in the British Columbia secondary curriculum guide that process-writing instruction would improve reading ability. Their experimental group received a semester of writing instruction, making significant gains in writing, but not differing from controls on the reading measures. Quinn (1987) altered the analogical content of reading selections as well as the availability of text information, but found no effect on the number of new ideas generated in follow-up arguments written by college students.

Braun (1984) was also unable to effect a difference between fifth-grade experimental and control groups in reading comprehension through five weeks of instruction in narrative writing. However, the study could be criticized as he taught a similar writing process to both groups, applying it to poetry with the control group and to narrative with the experimental group. The instructional techniques of modeling, monologuing, self-questioning, discussing and diagramming as well as the use of macro-cloze procedures might well have been more influential than the teaching of each structure (poetic or narrative). Differences between experimental and control groups could be expected to be reduced, then, if teaching cognitive processes is more important than teaching surface features in the transfer of learning from one language activity to another.

This argument is more persuasive when the results of the studies done by Hayes and Copeland (1982) and Harrington (1987) are considered. As described above, both these studies used writing instruction to effect a positive change on process measures of reading, such as inferencing and schemata use. In general, attempts to improve writing through reading instruction have largely been unsuccessful, except in a program which coordinated reading with writing instruction. Again, the factor influencing transfer may be whether or not the reading instruction focussed on processes or products.

The Connection as a Communication Act

From the University of New Hampshire come major proponents of providing real social contexts in which reading and writing processes can develop. In their classroom observational studies, Graves, Hansen, and Calkins have attempted to make student readers aware of an intentional author behind the print and to give student writers a readership for which to shape their written work appropriately (Graves, 1983; Hansen, 1983a; Graves and Hansen, 1983; Calkins, 1986). To Lamme and Childers (1983), beginners naturally create a social context in which to read and write. They observed that the "writing" of three two to four year olds was accompanied by much oral language and reading to share their work.

There is a strong argument in these works as well as in that of Smith (1984) and Holt and Vacca (1981) for the notion that children begin to absorb writing skills from their reading when they consider themselves as writers who can get content and stylistic ideas from other writers. Their comprehension develops at high levels as their authoring experiences equip them to interpret the intentions of other authors and to critique their works. Hansen (1983a) claims that the "connection" is one that is made by the children: "Authors who share their own writing and who ask other authors questions experience connections between reading and writing" (p. 970).

Olson (1983) videotaped readers thinking aloud as they followed a writer's directions. Half the writers were shown the videotapes of three readers; half were given no feedback. Those shown the videotapes made more revisions than those who were not, though no significant difference could be demonstrated in the quality of revisions.

An experimental line of research has been done at The Center for the Study of Reading in Champaign, Illinois. Tierney, LaZansky, Raphael, and Cohen (1983) conducted three studies. In the first, they were able to influence the author-reader relationship in 96 university student readers by manipulating topic familiarity (office vs. university setting) and writing each passage from the stances of four different roles (a vice-president, a dismissed executive or professor, a clerk or student, and a neutral point of view). In the second study, topic familiarity and discourse style (with or without dialogue) were manipulated for passages containing inconsistent information. In their 43 fifth graders, they found a tendency for poor readers' interpretations to be constrained by their undue "reverence" for the text. That is, they did not attain a sense of negotiation with the author. On the other hand, ". . . successful readers are self-initiating--they establish their own goals and re-write strategies for making meaning" (p. 17).

As part of the third study, think-alouds were used to observe 25 adult experts' intentions as they wrote directions for the assembly of a toy pump by a novice partner, and to observe those readers as they interpreted the authors' intentions. Interestingly, though there was not a close match between the authors' think-alouds and their texts, there was a match between the authors' and the readers' think-alouds. The results of these studies led the researchers to conclude that "reading and writing are both acts of composing engaged in as individuals transact with each other and their inner selves" (p. 2). They extend this observation to add that "the production and comprehension of texts are social events involving transactions similar to those which occur in the context of negotiations between people" (p. 24-25). Calkins, Smith, and Holt and Vacca each echo this sentiment in a personal exploration:

> Because I know that behind my own book there is an emperor with no clothes on, the books I read have taken on a more human dimension. I can see writers behind the texts, and I can learn vicariously from their successes and struggles (Calkins, 1986, p. 120).

> To read like a writer we engage vicariously with what the author is writing. We anticipate what the author will say, so that the author is in effect writing on our behalf, not simply showing how something is done but doing it with us (Smith, 1984, p. 9).

> Eating a cookie takes on new dimensions when one is aware of the recipe . . . or the baker. Baking a cookie takes on new significance when one can hear the eater say "well done" (and there is special satisfaction in both eating and baking when one has successfully baked and then eaten blissfully the cookie of his . . . own making). Reading and writing are so related. One reads best with a sense of writer; and one writes best with a sense of reader (Holt & Vacca, 1981, p. 940).

A Process Approach to "The Connection"

What does the research thus far reviewed contribute to a study of the connections from a processing point of view? Research has shown that the concerns which readers and writers have about the conventions of print develop concomitantly from the word level at young ages to the discourse level at older ages where meaning-making processes become the focus. Correlational studies confirm that there is indeed a relationship between reading comprehension scores and the surface features of written products.

However, such studies are unable to define the nature of the connection, whether, for instance, it lies in the knowledge of print conventions or in some underlying cognitive processing.

The nature of the connection has also been largely unaddressed by those attempting to effect an improvement in one skill through instruction in the other. The inconsistencies in their findings may indicate a need to better distinguish between instruction that examines surface features and that which provides opportunity to practice and transfer processes. Certainly those using generative writing--a way of processing what has been read--have successfully increased comprehension.

Success is reported as well by those who have melded reading and writing instruction in a social context in order for students to experience a connection between reader and writer, and between the informational, structural, aesthetic and process knowldege that might be learned from one another (Rubin and Hansen, 1984). Thus, one can apparently learn about writing by reading another's works; and experiencing the writer's point of view seems to contribute to comprehension.

Still the basic question of the present study remains to be explored: Are there some processes of writing which parallel processes of reading? If so, what are they? Certainly, some discussion of processes has arisen from the literature already reviewed. For instance, Tierney et al. (1983) suggests that transactions of the writer with himself as his own reader may facilitate distancing, problem-solving, discovery and monitoring. As well, those observing instruction within the social context have reported anecdotal notes which reveal development of processes in children.

In comparison, rather than observe the connections that children make between reading and writing, the present study attempts to identify processes which are parallel between the two, whether consciously recognized or not. It is to the topic of cognitive processing that this review now turns.

Process Research

Using problem-solving models, a number of researchers have attempted to describe the cognitive processes underlying either reading or writing. While results suggest some similarities between the processes of the two language activities, few investigators have attempted to compare reading and writing processes directly. Methodologies are being borrowed by both the reading and writing fields from cognitive psychology that would permit such comparative studies to be done. These methods include introspection, retrospection, and protocol analysis. After reviewing studies in both fields that use these methods, their contributions to an understanding of cognitive processes is summarized and discussed.

Reading Processes

Thorndike proposed the idea of reading as an active process in 1917. Goodman (1965, 1967, 1973) popularized the notion of reading as a hypothesis-based process in which readers actively sample, predict, test and confirm. Smith (1978) saw this comprehension process as being instinctive to all learning situations. Hunt (1982) drew a convincing parallel between reading and research processes, emphasizing an interactive rather than linear nature. Gates (1983) described readers as strategists who use problem-solving techniques.

Support for the theory of active cognitive processes in reading does exist in the research. Olshavsky (1975) placed red dots after independent clauses in a story. She asked 24 tenth grade students to read the story silently. At each red dot, they were to retell what they had read and its meaning as well as to tell what they did and thought as they read that section. Reading the story in this manner was followed up with a re-telling of the story, an informal discussion of the subject's reading behavior, and an interest inventory. Protocol analysis yielded these categories:

1. Personal identification
2. Use of context
3. Synonym substitution
4. Use of information about the story
5. Stated failure to understand a word
6. Re-reading
7. Inference
8. Addition of information
9. Hypothesis
10. Stated failure to understand a clause

Olshavsky found that proficient readers provided more responses than non-proficient readers, especially in the categories of hypothesis, use of context, addition of general information, and oral reading. She also found a different use of strategies by those with a high interest level compared to those with a low interest level, and by those reading abstract compared to concrete materials. She offered these results as evidence that reading is a problem-solving activity.

Marr (1983) also used these methods with tenth graders in a study of how strategy use varies depending on familiarity with the topics of texts. Relative knowledge was tested two weeks before the study was done. Think-aloud protocols were analyzed into the strategy categories devised by Olshavsky (1976-77) and Hare and Smith (1982). Good readers made more summarizing and metacognitive responses, drew more inferences and made more evaluative statements than did poor readers. Prior knowledge was a significant predictor of the amount of evaluating done, but strategy use became more consciously accessable when reading the low-knowledge article.

Hare (1981) collected written retrospective protocols from good and poor undergraduate readers instructed to think about what they did as they read and to record these thoughts when they finished reading. Each read a high- and a low-knowledge article. Categories identified included recognition of comprehension problems and the problem solving strategies of rereading, personal identification, chunking words, reading every word, reading for meaning, reading selectively, adjusting reading speed, using context, substituting a synonym, inferencing, adding information, hypothesizing, and using information about the story. Results confirmed Olshavsky's with good readers providing more protocols related to problem recognition and a greater range of strategies for solving those problems than did poor readers. Good readers also monitored their comprehension twice as often as poor readers, especially on the low-knowledge article.

Olson (1979) focussed her study of strategies on elements at the discourse level by placing red dots at natural junctures such as at a change of setting, mood or event, after dialogue or at the end of paragraphs. Like

Olshavsky, she asked fourth graders to read silently but to tell what they were thinking at each red dot, and to retell the story when they had finished reading. A follow-up interview dealt with character analysis, plot and theme. Olson used these categories in her protocol analysis:

1. Extending beyond given information
2. Relating story information to purpose for reading
3. Using background knowledge for comprehension
4. Reducing alternatives for continued story action
5. Retelling
6. Failing to comprehend

Olson concluded that each child gave a different response to the same materials because they were constructing meaning in a personal way.

Olson, Mack and Duffy (1981) had college students think aloud after each sentence in two well-formed stories and essays as well as in two poorly-formed stories and essays. Protocol analysis revealed that the readers produced predictions, questions, comments on structure, comments on own behavior, confirmations of predictions, references to antecedent information, inferences, general knowledge, and associations. They found differences between the approach taken to reading stories compared to that for reading essays. The story readers made more predictions than the essay readers (one-third of productions compared to one-quarter on essays) and more specific predictions about where the story was leading.

Ryan's (1985) naturalistic approach to strategies research involved observation, interviews, checklists, anecdotal notes, audiotaping and analysis of work samples. Analysis of protocols from her elementary school subjects produced six strategies: reporting the literal message, conjecturing, contextualizing within existing memory schema, structuring, monitoring, and repairing.

Harste (1986) also took a somewhat different approach to collecting introspective protocols. He asked his 73 graduate students to keep journals of their thoughts as they read a specified novel. By identifying strategies such as making personal connections, recasting in familiar terms, critiquing either the author or the self as reader, and extrapolating, he estimated that good readers spend 69% of their time "off the page." He also recognized the problem-solving strategies of predicting alternatives, searching for clues and testing hypotheses.

McPike (1983) was interested in how sixth graders determine main idea. She interviewed them about their strategies before they read. After reading she asked for retrospective comments to probe questions about strategies and selection of important information. Among her conclusions, she observed that "each reader provided a personalized contextual frame upon which he built his interpretation. Context is not found in the text but is a product of the interaction between reader and writer (text)" (p. 157).

Afflerbach (1987) also obtained think-aloud protocols. He found an effect of familiar and unfamiliar contents on the main idea construction of two doctoral students--"expert" readers. They used the processes of hypothesizing, finding the topic and commenting on it, drafting and revising, listing and automatic main idea construction.

In his study, Ramey (1985) found evidence that use of cognitive planning is predictive of success in reading comprehension. Thirty ninth-graders were identified as good or poor planners through a battery of tests. Four years later, intropective and retrospective protocols were collected from them for three types of text (narrative, expository and persuasive). Good planners inferenced, speculated, revised hypotheses, questioned, evaluated and related the texts to their own background experiences more than did poor planners.

In summary, these investigators were interested in building models of the proficient reader's comprehension processes. In the two studies of main idea, comprehension goals were imposed by the researchers, thus yielding some strategies specific to accomplishing that goal. Still the occurrence of other strategies replicated some of those found by researchers interested in developing a more complete picture of comprehension processes. While the terminology used differed from study to study, similar strategies emerged. Those at the discourse level might be summarized thus:

Relating story information to the purpose for reading
Questioning
Hypothesizing
Re-reading
Re-telling or reporting important information
Inferring
Structuring
Revision of hypotheses or repairing
Confirming hypotheses
Stated failure to understand
Monitoring
Evaluating

Though good and poor readers generally used the same strategies, good readers clearly used them more often than did poor readers. They brought more of their background knowledge, hypotheses and opinions to their interaction with texts. That is, they were cognitively more active and gave personal meaning to authors' messages.

Writing Processes

Writing processes have commonly been described linearly as prewriting, drafting, revising and publishing in a form to be shared with others. For instance, Britton (1978) describes processes of preparation, incubation and articulation. Much research has been done into these stages.

Eight twelfth grade students composed aloud as they wrote on subjects provided the previous week by Emig (1971). Emig then interviewed them about their prewriting and planning which she found was rarely in written form and could occur at any time during the writing. She defined these processes on the basis of protocol analysis:

1. Prewriting and planning
2. Starting (actual writing)
3. Stopping (realizing that the piece is finished)
4. Contemplating (evaluating, considering reader's perceptions)
5. Reformulation (revision, correcting, rewriting)

Sixty fifth graders wrote narratives for Sawkins (1971) who then interviewed each subject the following morning. Protocols from the 15 subjects who wrote the highest-rated stories as well as from the 15 who wrote the lowest-rated were selected for further analysis. Like Emig, Sawkins found that most children gave some thought to the content (prewriting) before starting, but that few wrote down notes or an outline. Only one child had a complete story planned beforehand; most planned only a few sentences ahead with the endings coming to them about mid-way through the writing. Compared to those who wrote poor stories, those who wrote good stories were better able to discuss writing techniques, and used paragraphing more often. Those who wrote poor stories seemed less aware of writing techniques as they were unhappy with the beginnings and endings of their stories, and had problems with mechanics as well. For both groups, proofreading was generally done to correct mechanics, though some content was edited; rewriting, if it was done, was aimed at improving appearance.

In a British study, four ten year olds and four twelve year olds composed aloud for Schumacher and Martin (1984). Twenty-two categories were used to analyze the protocols, but those used most often by these age groups involved referring to their own experiences, planning what to write next, selecting words, or reviewing what was already written. Because the categories "global planning" and "effect on reader" were rarely used, these researchers concluded that the subjects used a "knowledge-telling strategy" rather than rhetorical planning and problem-solving (p. 281). However, it does not seem possible to dismiss the problem-solving elements involved in these subjects' writing even if it is at the simplest level of selecting from one's own experience what to write next and then deciding on the words with which to express the re-telling.

Sawkins' together with Schumacher and Martin's results generally concur with Stallard's (1972), despite the fact that Stallard observed and interviewed older high school students. Both the 15 good writers and the 15 controls showed little concern for planning the structure of their piece nor for whom their readership would be. As well, 60% of both groups wrote as it came to them, not anticipating to what conclusion they would be led. While Schumacher and Martin might consider this to be similar to the "knowledge-telling strategy" that they observed, the behavior of good writers in Stallard's study is testimony to the problem-solving that they must have been doing. Compared to controls, good writers spent three times the amount of time "prewriting", gave twice the amount of time to the writing task, revised more elements of expression and sentence structure, reviewed their work more frequently, and were much more concerned about making their purpose clear.

Differences in topic assignment might also account for some of the differences in writing behavior observed in the three studies. The assignment to write an opinion of a news event given to Stallard's subjects, and the narrative assignment given to Sawkins', might be expected to elicit more evaluative and problem-solving behaviors than would the assignment to describe something familiar given by Schumacher and Martin to their younger subjects.

Over a period of five months, Graves (1975) observed and interviewed second-graders from four classrooms to gather contextual data for eight case studies. As well, children were occasionally interrupted while writing to inquire about their reasoning. Overt behaviors were reported: prewriting activities, composing (spelling, use of resources, accompanying language, pupil interaction, proofreading, rereading, interruptions, erasures, teacher participation), and post writing. Specific inferences about processes were not reported, but Graves did develop two writer profiles which reflect developmental stages in writing. Reactive writers rehearsed aloud before writing. They had little sense of audience and evaluated their written work according to emotional responses. Reflective writers showed few signs of rehearsal (it was suspected that they planned silently), reread frequently, had a sense of audience and used more objective reasoning in evaluating their writing.

Bouchard (1983) observed four fourth graders as they participated in eighteen writing workshop sessions over six weeks. She interviewed them about writing processes before it began and at its conclusion. The children also wrote comments regarding their attitudes after each session. Results revealed a personal approach to writing by each child. They differed on goals, methods, amount of time needed, and the importance of length, revisions, and interaction with others. Pre-composing, composing and reviewing were observed to occur as a linear series of steps for some subjects but in short, repetitive cycles for others.

In this study, Bouchard uses "processes" to refer to writing behavior (precomposing, drafting, sharing, revising, editing and publishing). It might have been valuable as well if she had interpreted cognitive processes from the children's comments, especially from their methods. For instance, some of her subjects used their friends' names or story starters which might be interpreted as using prior knowledge or as having affective implications. It is on this point which Crismore (1979) critiques the Graves (1975) study where the same types of behavior rather than cognitive processes were described.

Nolan (1978) attempted a comprehensive description of the mental processes of good grade six writers through protocol analysis. In retrospective interviews, he used video-tapes of each subject composing aloud to stimulate recall of processes used. He devised three general categories of responses:

1.0 What to write?

2.0 How to write it?

3.0 What is it like?

These were further broken down into 43 facets of composing a story. Some are suggestive of mental processes, but many are simply a list of story elements which the subjects referred to (eg. stylistic choices, setting, theme, humor) rather than a set of processes used to make decisions and selections in regard to these elements. He was also interested in phenomena he described as "thinking ahead," "thinking back," and "spontaneous thinking". Again, he found writing processes to be combined in personal ways with no common series of stages evident.

Observing 17 freshmen during five writing sessions, Pianko (1979) found few differences between age and sex groups. However, an analysis of videotapes and follow-up interviews showed that remedial writers did not reflect on their writing to the extent that traditional writers did. In comparision, the traditional writers did more planning and monitoring; they paused twice as often, and rescanned three times more often than the remedial writers. It appeared that subjects in this group were more concerned for getting their ideas across while the remedial group was disproportionately cautious about mechanics.

Perl (1979) had five "unskilled" university freshmen compose four assignments aloud. She also interviewed them after one session. Using protocol analysis as well as applying miscue analysis to editing protocols, she was able to thoroughly describe their writing behavior and to define composing as a process of "construction and discovery" (p. 331). Perl provided evidence to support Smith's (1982b) description of writing as a process of translating intentions into language, the language chosen often having the effect of adding new and unexpected dimensions of meaning.

Perl (1984) devised a comprehensive system for coding the composing process. It is certainly more revealing of mental processes than those used by previous researchers. The major categories include:

Planning
Commenting
Rehearsing
Rehearsing leading to writing
Speaking the words while writing them
Questioning
Assessing
Reading
Writing (drafting)
Revising
Editing
Repeating phrases or sentences
Metacommenting

However, with over 27 possible types, subscripts or superscripts added, this could prove to be a cumbersome system.

Through much discussion of the studies reviewed above, the perception of writing has evolved. It is no longer viewed simply as a set of steps followed linearly to express a pre-determined message. Writing is now considered to begin with an intention to express a thought, but through a personal pattern of interactive processes--such as planning, translating, reviewing, revising and monitoring--that thought can be altered and even lead to new discoveries for the writer.

Reading and Writing as Parallel Processes

Some of the data obtained through introspective and retrospective techniques in the separate fields of reading and writing have been interpreted in similar terms. The concept of composing messages in personal ways arises in both fields. Readers become co-authors as they impose personal goals and use their own background knowledge to re-construct a message from what they read. Writers become co-readers as they discover new meanings added to their thoughts by the language they have used. In both fields, "good" readers and writers applied strategies more often than did their "poor" counterparts.

The terminology used in the two fields, however, differs sufficiently to preclude a direct comparison of component processes. Reading researchers have tended to use terms such as hypothesizing, inferring, and confirming while writing researchers have tended to use planning, drafting, and editing. Terms emerging in common to the reading and writing areas include goal-setting, questioning, using knowledge schema, re-reading, revising, monitoring, and evaluating. Some researchers have thus made the hypothesis that the similarities between reading and writing may lie not only in the medium of written language that they share, but in the cognitive processes that are used for each.

A pioneering study was done by Birnbaum (1982) who developed case studies for eight subjects considered to be both good readers and good writers. Four were in the fourth grade and four in the seventh grade. Each subject read three types of texts (fiction, fantasy and a factual account) alternatively with writing three types of text (expressive, poetic, and transactional). After reading, subjects retold the story and answered comprehension questions. After writing, subjects were asked about their writing and the writing processes used. Videotapes were analyzed for overt behaviors (eg. moving the lips during silent reading) that could be interpreted cognitively. Subjects were also audiotaped while reading aloud and composing aloud. Miscue analysis was applied to the oral reading. Ecological data was also collected.

In Birnbaum's study, the methods used to observe the two language processes differed. Introspective and retrospective data were targeted for writing while miscue analysis was done and cognitive levels of comprehension established for reading. The data could be used to describe the processes, but not to defend a thorough matching of cognitive processes between reading and writing. Good readers were observed to survey, sample, respond cognitively and affectively, hypothesize, and contextualize. Good writers were observed to select, evaluate, analyze, synthesize, revise and monitor. Tendencies shared by good readers and writers were discussed in terms of their reflection on processes and strategies used, their monitoring, and a focus on meaning-making.

On a smaller scale, Boutwell (1983) asked a third-grader in her classroom to tape record her thoughts independently while she read and wrote. She did both activities "in spurts", rereading and rewording passages whenever the meaning was unclear. Observations of all her students convinced Boutwell that the conferencing instructional model she had used made her students quite conscious of the strategies they were using and thus quite involved in the print they were reading and producing.

Eight good readers and writers were profiled ethologically by Ryan (1983). Thinking processes were targeted through observation, problem-solving interviews and a tutoring activity. Six strategies used by these subjects were common to reading and writing narrative and expository text: reporting, conjecturing, contextualizing, structuring, monitoring, and repairing. Some subjects used reporting almost to the exclusion of other strategies (a reactive pattern), while other subjects were more balanced in their strategy use (a transactive pattern). Transactive patterns matched in reading and writing for only three of the subjects. The remaining subjects selected strategies in proportions that differed from reading to writing. Thus, Ryan begins to describe specifically the strategies that readers and writers both employ and the patterns of strategy combinations they tend toward.

The first to use a sufficiently large number of subjects (61) in such a study as to be able to analyze her data statistically, Langer (1984) compared third, sixth and ninth graders. She collected introspective protocols from half her subjects while they read and wrote stories and reports; from the remaining subjects she elicited retrospective data. She also used probing questions to find out about strategy use and awareness, knowledge use and decision-making. Text-based questions were asked as well to find out how the subjects' meaning construction evolved. Protocols were analyzed primarily as "reasoning operations" (schema, hypotheses, metacomments, evidence, validations, questions and assumptions), "strategies" (generating ideas, formulating meaning, evaluating, and reviewing), and monitoring behaviors.

Langer found these cognitive processes to underlie both reading and writing, but to be used in differing proportions and patterns depending on the language activity and the age of the subject. For instance, readers were more concerned about schema (49% of protocols) than were writers (36%). Readers were also more concerned for validating and monitoring their meaning construction than were writers--who made more hypotheses and metacomments, and who monitored goals, genre, mechanics, and lexical choices more often. Subjects were more aware of their strategy use when writing than when reading, though this awareness of writing strategies decreased through the grades, apparently as subjects gained experience with writing.

A promising approach to the interrelationship of reading and writing was taken by Scott (1985). She used results of reading research to hypothesize superior problem detection by good readers on revision tasks in writing. Indeed, the quality of final drafts written by sixty grade five students did correspond with problem detections made during the revision process and thus with reading ability. It would seem appropriate to conclude, then, that problem identification is a strategy needed by both readers and writers.

The effect of different tasks on the reading/writing strategies used by four college freshmen was investigated by Lowe (1985). Subjects read and responded to four essays, and discussed strategies used after composing four pieces aloud. Analysis, comparison, classification and cause/effect tasks were required. Although categories for protocol analysis were not as comprehensive as Langer's, and deficiencies seemed to be targeted rather than specific strategies, some general patterns emerged which applied to both reading and writing activites. Little previewing of reading material was done nor was prewriting more than mental consideration for local (as opposed to global) planning. Re-reading was not done to revise understandings of texts read, nor was re-writing done to improve coherence; rather, surface features were revised.

In a similar study, Kirby (1986) videotaped five high-risk freshmen and used the tapes to obtain retrospective interviews. Generally, reading and writing processes were described separately, but it was noted that success was dependent on personal experience and interest, and that monitoring improved when subjects wrote about the texts they read or read aloud the texts they wrote.

In summary, significant contributions of data that draw parallels between the cognitive processes in reading and writing have been made by the small-scale descriptive studies of Birnbaum (1982), Boutwell (1983) and Ryan (1983), while Langer (1984) and Scott (1985) can draw inferences supported with statistical confidence. Observations of cognitive processes have arisen from the research of Tierney et al. (1983) as well, though their main findings have been discussed in terms of transactions between readers and writers. The research cited suggests that some cognitive strategies are shared by reading and writing, though they may not be applied in parallel patterns or proportions. Dealing within the realm of cognition--because it is not directly observable--it is not surprising that the existing studies have relied upon introspective and/or retrospective reports for data gathering. Indications from the research are that any theoretical model must take into account individual differences in strategy selection and patterns of combination.

A Theoretical Framework to Parallel Reading and Writing

To describe writing as a productive process, encoding a message into print, and reading as a receptive process, decoding print into a message (that is, as the inverse of writing) is now considered a simplistic view (Goodman, 1973; Read, 1981). Reading specialists who consider the reading process to be constructive, and writing theorists who consider writing to be a process of discovery are now beginning to draw comparisons between the two. They make the following convincing arguments that both are oriented toward meaning-making and are interpretive (Stock & Wixson, 1983; Roskelly, 1984; Flower, 1987).

First, there appear to be general types of knowledge that are shared by readers and writers (Thomas, 1985). Rubin and Hansen (1984) define these concisely as:

Information Knowledge (word meanings, world knowledge, and concepts);

Structural Knowledge (discourse or genre schemas);

Transactional Knowledge (concepts of the reader-writer relationship);

Aesthetic Knowledge (how the sound and rhythm of literature elicit an affective response); and

Process Knowledge (strategies).

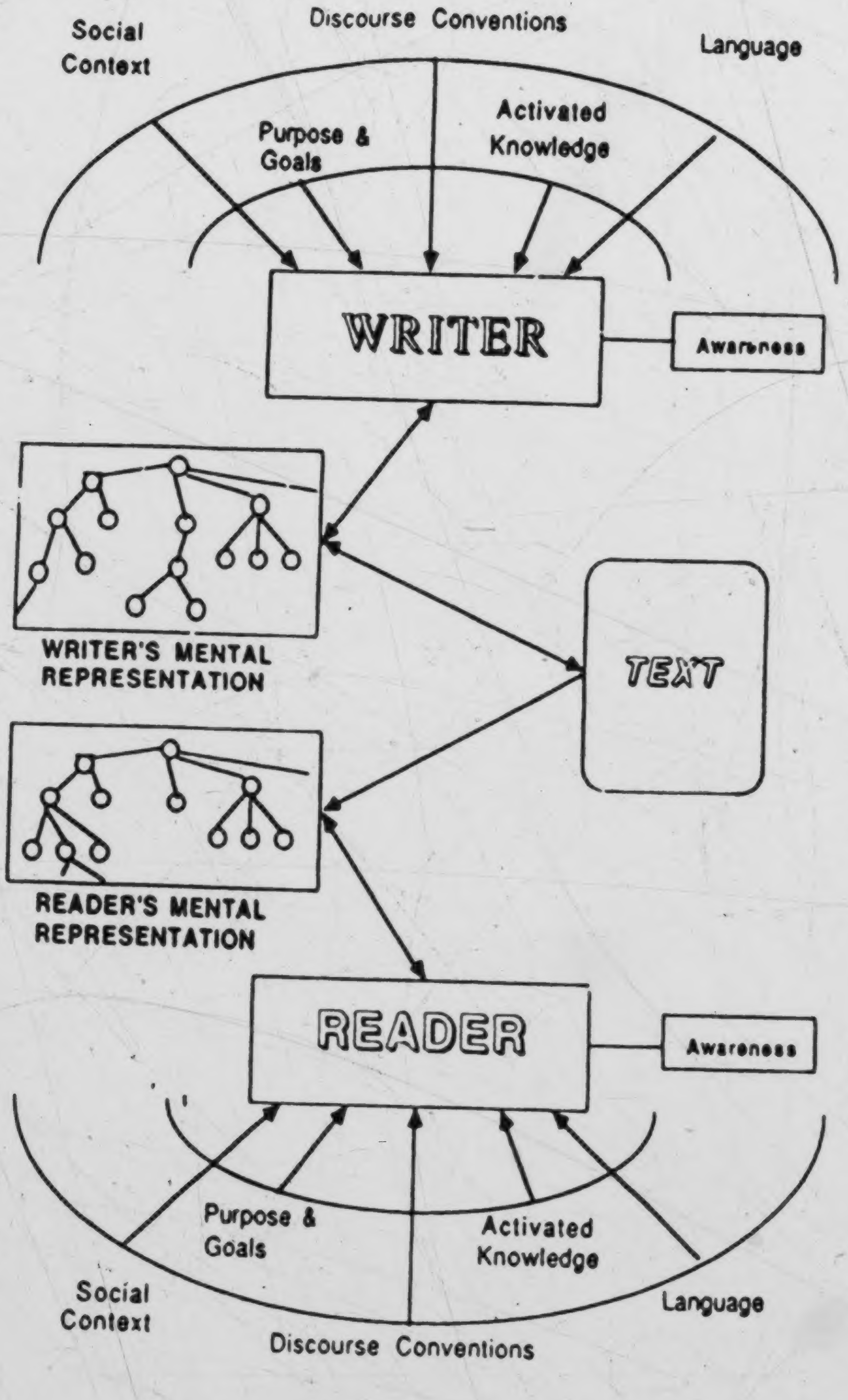
These specifics lend substance to Goodman and Goodman's (1983) claim that "the schemata for predicting texts in reading are essentially the same as those used in constructing texts during writing" (p. 591). In a similar vein, Frank Smith (1982b) contends that writers "intentions" and readers "expectations" both represent preformed frameworks for anticipating what meaning will emerge.

Second, both construct new networks of knowledge schemas by relating existing schemas to new information or ideas that are discovered through the language of a text (Petrosky, 1982; Moffett, 1983; Kucer, 1985; Roskelly, 1984; Botts, 1983). It follows that the course of either process is determined by an individual's prior background knowledge. Thus, one text may lead different readers or writers to discover different nuances of meaning. Flower's (1987) diagram in Figure 2.1 identifies simply the forces acting upon individual writers and readers in order for each to develop essentially similar yet differing "mental representations" of a text's meaning. Depending on one's goals, changes in knowledge networks or activation, etc., different representations may prevail at different times. The author may even "instantiate" ideas with a variant of the text.

Third, for both reading and writing, the process of meaning-making is evolutionary and recursive, with predictions made tentatively to be confirmed or revised in light of further text processing (Kucer, 1985; Aulls, 1985). Whether from writing or reading, derived meanings must pass the tests of logic, coherence, goals, context, and conformity to known text types and organizations; otherwise, revisions are made (Kucer, 1985).

Finally, the strategies used in reading and writing to arrive at an individually satisfying meaning have been paralleled with support from the research already cited. Both would seem to involve planning by activating and selecting from relevant prior knowledge; setting purposes; rereading and revising; awareness of problems in the development of meaning; and monitoring or distancing the self in order to evaluate the success of attempts to meet goals and to determine follow-up strategies (Tierney & Leys,

Figure 2.1. A Conceptual Model for Discourse Construction (Flower, 1987, p. 129)


Social Context
Discourse Conventions
Language
Purpose & Goals
Activated Knowledge
WRITER
Awareness
WRITER'S MENTAL REPRESENTATION
TEXT
READER'S MENTAL REPRESENTATION
READER
Awareness
Purpose & Goals
Activated Knowledge
Social Context
Language
Discourse Conventions

1984; Aulls, 1985). These strategies will be examined further in the section on metacognition and monitoring.

As an aside, it cannot be denied that these strategies resemble those considered to be general problem-solving or thinking skills. Indeed, Raburn and Van Schuyver (1984) provide data that correlates reading and writing significantly with thinking. Chaffee (1985) discusses a computerized diagnostic test which uses thinking skills to measure reading and writing processes. Baird (1983) showed problem-solving skills to be similar across different fields, yet implemented differently. Are reading and writing separate fields? Or is enough common ground shared that strategies are applied in the same ways and can thus be easily transferred from one to the other?

Tierney's Model

Tierney (1983) was apparently the first to propose a model paralleling the reading and writing processes (see Figure 2.2). He was inspired by Flower and Hayes' (1981a) cognitive model of writing, derived from their analysis of the introspective talk-alouds of writers.

The Flower and Hayes' model accounts for the writer's long term memory and the task environment (the rhetorical problem and text produced) as well as the writing processes of planning, translating, reviewing, and monitoring. The arrows in the model in Figure 2.2 indicate that the text

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This page contained:

Figure 2.2
Tierney's Model Paralleling the Reading and Writing Processes
(Tierney, R. J. (1983). Writer-reader transactions: Defining the dimensions of negotiation. In P. Stock (Ed.), Fforum: Essays on theory and practice in the teaching of writing (p. 148). Montclair, NJ: Boynton/Cook)

produced influences further writing processes. The model thus appears to accommodate Murray's (1975) belief that revision is affected by discovery, that "the process of discovery, of using language to find out what you are going to say, is a key part of the writing process " (p. 91). He claims that "writers move back and forth through all stages of the writing process as they search for meaning and then attempt to clarify it" and suggests _prevision_, _vision_, and _revision_ in place of prewriting, writing and rewriting in order to "emphasize the essential process of discovery through writing" (1978, p. 86).

The model also accounts for Graves' (1983) interactive writing pattern of "select, compose, read, select, compose, read ..." (p. 226) where Planning is "selecting," Translating is "composing" or reduction of an image into language, and Reviewing is "reading." Finally, the model is consistent with Smith's (1982b) conception of the writing process. For him, "intentions" (Planning) in thought are altered by the text they produce through rereading (Reviewing). Too, Smith is curious about the "transmutation" (p. 46) of meaning into words (Translating), and he mentions the importance of monitoring to determine if further revision is needed. He has observed that good writers frequently look back, reread, rework, reflect and reread again before writing.

Perl (1983) refers to this shifting back and forth as recursiveness--"a forward-moving action that exists by virtue of a backward-moving action" (p. 44). This pattern emerged when a group of teachers composed aloud on their own into tape recorders. It is this recursive property that makes writing a discovery activity. It moves the writer toward a "felt sense, to what is not yet in words but out of which images, words, and concepts emerge" (p. 46-47). Perl continues to explain:

> Once we have worked at shaping, through language, what is there inchoately, we can look at what we have written to see if it adequately captures what we intended. Often at this moment discovery occurs. We see something new in our writing that comes upon us as a surprise (p. 48).

This model of writing has also allowed for continuing elaboration upon elements such as planning (Flower & Hayes, 1981b) and revision (Hayes, 1985; Flower, Hayes, Carey, Schriver, & Stratman, 1986). From the point of view of writing researchers and theorists, then, this model seems to be a valid representation of the writing process. Tierney (1983) argues for its validity in representing reading processes as well.

The reader's task environment, like the writer's, involves the nature of the assignment given to or designed by him or her, the importance of the task to that reader, and the reasons (goals) that he or she has for reading in a given context. Knowledge schema held in long-term memory by an individual reader influences reading plans--the ideas and hypotheses that are generated, as well as how they will be organized in relationship to the text and to what the reader is looking for in the text (goal-setting). In light of the perception of readers as hypothesis-testers, reviewing to evaluate and revise an emerging model of meaning is appropriately included in their processing. The watch-dog over this emerging model is the Monitor--another or distant self that regulates and checks the success of each process according to desired goals. The text read to any point influences the recursive pathways of the reader's composing, causing the reader to review, replan, and further refine the model of meaning.

If there is a weakness in this model, it may be in using the separate terms "Translating" and "Progressive Refinement of a Model" in parallel. Certainly in writing, the notion of translating one's thoughts into a representative text applies. Yet, most writers go beyond translating. For the writer who discovers more than he or she originally set out to communicate, a model of meaning has been refined. As such, Tierney's term would apply to both the reading and writing processes.

Further argument for a composing model of reading is made by Tierney and Pearson (1983). They present the diagram found in Figure 2.3, which exhibits the essential elements of Figure 2.2 but which perhaps lacks a depiction of the influences of long-term memory, the level of motivation, the task undertaken, and text processed at any given point. However, they begin a discourse on the characteristics of specific components of a theoretical model.

They examine planning to show how the reader's goals and activation of knowledge are dependent upon and influence one another in a "symbiotic relationship." The reader's first draft is an initial hypothesis about the scenerio of the text together with schema instantiation as reading continues. Readers and writers align themselves with one another, assuming stances (eg. sympathetic, critical, or passive) and roles (eg. observer or participating character). Revising, for both, can involve rereading, annotating, and questioning to refine the model of meaning that they are creating. Monitoring involves distancing the self from a text to allow evaluation of the success of strategies or when one should be brought into play over the others. The arrows between each component of the model represent the simultaneous interplay between the component processes.

The aim of the present study was to provide support for the Tierney model in Figure 2.2. Parallel instructions were designed for reading and writing tasks during which subjects

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Figure 2.3
Some Components of the Composing Model of Reading
(Tierney, R. J., & Pearson, P. D. (1983). Toward a componsing model of reading. Language Arts, 60 (5), 578.

thought aloud. Protocols were coded in terms defined according to the model in order that direct comparisons between reading and writing data could be made. The model does not define any patterns for combining components, thus allowing for a wide range of individual variation. The present study sought to identify some patterns that would be generalizable to more than one individual and which would represent processing tendencies common to reading and writing.

Metacognition and Monitoring

Cognitive processes and strategies are terms that are often used interchangably. A distinction is made, however, by those discoursing on metacognition and monitoring. "Strategies are not necessarily different actions; they are skills which have been taken from their automatic contexts for closer inspection" (Paris, 1983, p. 10). That is, they are processes that are consciously or metacognitively applied (Brown, 1978). Brown and Palincsar (1982) differentiate between the "self-regulation" of any action and the capacity for "reflection" upon one's own processes (p. 5). Monitoring most often demands a conscious effort when a snag is met in meaning-making (Brown, 1980; Paris, 1983; Rinehart & Platt, 1984). It is at this point that one becomes aware of one's thinking processes, and given the experience to do so, can manipulate those processes in such a way as to solve the problem efficiently--that is, strategically.

Before problem-solving strategies can be deployed, the learner must first recognize or become aware that a problem exists. Markman (1979) and Garner (1980) have shown that, compared to older or better readers, young readers (grades three to six) and poor readers in junior high school do not often recognize inconsistencies in texts. While third to sixth grade subjects may know the steps for detecting inconsistencies, they seem instead to focus on assessing the truth and completeness of texts. Thus, Markman (1979) suggests that "prior to a deliberate analysis we may fail to realize that we have not understood" (p. 643). This observation could certainly be extended from reading to writing activities and be offered as one reason that writing is often a discovery process. A deliberate analysis may constitute comparing information to detect inconsistencies or testing hypotheses as a test of comprehension (Markman, 1981).

Good and poor readers have also been studied for their levels of awareness and control over processes. Haugh (1983) asked good and poor readers from grades two and five about the purposes of reading and writing. While there were no grade differences in awareness of the purposes of reading, there was a significant difference for writing. As well, good and poor readers differed in their awareness of the purposes of both reading and writing. Paris and Myers (1981) found that good fourth grade readers were more effective monitors while poor readers used ineffective strategies, often to decode rather than comprehend. Hare and Smith (1982) found that good readers used more memory strategies than did poor readers at the sixth grade level.

Other researchers have shown that metacognitive awareness of reading or writing strategies is a function of age, developing gradually through the grade levels (Brown & Smiley, 1977, 1978; Myers & Paris, 1978; Markman, 1979; Prescott & Doyle, 1986). Still others have taught metacognitive strategies, reporting significant positive effects on the comprehension of third to sixth grade students (Brown & Palincsar, 1982; Paris, 1983; and Tregaskes, 1987) and on the writing skill of fifth and sixth graders (Raphael, 1986).

Brown (1978, 1980) expounds upon the various forms of self-awareness, inducing knowing when you know and don't know, knowing what you know and don't know, knowing what you need to know to solve a problem, and knowing which strategies are effective in a given situation. Paris (1983) also emphasizes the importance of "conditional knowledge"--knowing the appropriate context in which to apply strategies.

Strategies that promote metacognitive control include predicting, planning, checking and monitoring (Brown, 1978).

> Prime executive functions include *planning* activities prior to undertaking a problem (predicting outcomes, scheduling strategies, and various forms of vicarious trial and error, etc.), *monitoring* activities during learning (monitoring, testing, revising, and re-scheduling one's strategies for learning) and *checking* outcomes (evaluating the outcome of any strategic actions against criteria of efficiency and effectiveness" (Brown & Palincsar, 1982, pp. 2-3).

The present study is concerned with the cognitive processes used by readers and writers, whether or not they were consciously or strategically applied. Nevertheless, to obtain self-report data from subjects requires that they at least be aware of what they are thinking, whether or not they have mastered strategic control over their processes. It could be questioned whether all "awarenesses" of processes, if coded in what Vygotsky (1962) called "inner speech", are easily verbalized, especially by elementary students. The extent to which subjects are able to verbalize about their thinking determines the availability of data from which the researcher can make inferences about processes. Not to deflate the value of verbal report data obtained from children, this comment is made to keep the possible limitations of such a study in mind. In the present study, the criteria for selection of subjects included good verbal facilty both as readers and as writers. Thus, an attempt was made to minimize the negative effects that poor verbal skills would likely have upon the availability of self-report data.

Summary

This chapter provides an historical review of research into the reading-writing connection. The "connection" from a developmental point of view has tended to focus on surface features of print. Apparently, as young children learn concepts of text structure and symbols (such as order, direction, and spelling) in reading, they also learn to manipulate those structures and symbols in their own writing. Correlational studies have repeatedly shown a connection between reading comprehension and quality of written products, though they do not identify the reason for this correlation. A few educators have attempted to effect academic gains in one process through instruction in the other--with inconsistent results, perhaps due to the kinds of instruction given (product or process oriented). Another group of researchers have examined the communication act as the connector between reader and writer. Their studies indicate that such a connection exists and that heightening the awareness of it in elementary students also facilitates their learning of the reading and writing processes.

Of prime interest to the present study are the processes used by readers and writers, and how they might be similar. Researchers using introspective and retrospective techniques have been able to infer processes for both reading and writing, but few studies have been done to parallel them. One point is clear from the research: processes are selected and combined in patterns that may be unique to each individual, influenced as they are by the task and by the subject's knowledge schema. As well, it is apparent that composing is basic to the nature of reading, as discovery is to the nature of writing.

Tierney's model paralleling reading and writing processes was presented as a theoretical framework for this study. Besides identifying processes, it was shown to account for the interaction of the task environment and a learner's knowledge schema with a text. It was also shown to account for the evolutionary and recursive aspects of meaning-making processes.

Finally, metacognition and monitoring have been discussed in order to differentiate between automatic processes and consciously applied strategies, and to present some research relevant to the study of strategies at different age and ability levels. This discussion of metacognitive awareness suggested some of the implications of relying on self-report data.

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CHAPTER 3

RESEARCH DESIGN

The purpose of the study was to analyze the strategies used by good sixth grade readers/writers for evidence of similarity between reading and writing in the cognitive processes used. In the attempt to accomplish this, eight good sixth grade readers and writers were asked to think aloud as they wrote a narrative in one session and read a narrative in another session. The subjects were then asked to go back over the story and tell again what they were thinking as they had read or written it. An interview followed each session. Thus, both introspective (thinking aloud) and retrospective (follow-up review and interview) techniques were used to collect data on cognitive processing. Protocols were divided into clausal units, analyzed for processes, and interpreted in terms of the model proposed by Tierney (1983).

In order to contextualize and to help verify findings of the protocol analysis, data about the background, classroom environments and typical performance of subjects were also collected. Informal interviews were conducted with subjects, teachers were interviewed about the subjects as well as about their Language Arts programs, and subjects' journals and cumulative files were surveyed.

A pilot study of two subjects was conducted to evaluate the appropriateness of the specific passages selected and interview questions devised. Minor changes in phrasing were made before carrying out the main study.

Selection of Subjects

The study originally began with 12 subjects, two for the pilot study and 10 for the study itself. In order to obtain 12 subjects in one middle-class school, 16 sixth graders who achieved at or above the 75th percentile on Edmonton Public School Board's (1979) Elementary Reading Survey Test: Grade 5 (administered in May of the previous year), were identified. English was the first language of each student. The school's two Grade 6 teachers eliminated those who no longer attended the school or who were considered to be less capable than indicated by the test. They confirmed 11 of the students to be both good readers and good writers who would be willing and verbal participants. In order to obtain a twelfth subject--who would be one of two participants in the pilot study--one girl at the 74th percentile was also selected. Parental consent for the children to participate in the study was obtained.

After the data had been collected, a decision was made to eliminate two of the boys and one girl from the study. One boy was eliminated on the basis that one of the pieces he wrote was not a narrative. The other boy provided very short protocols. The girl was dropped from the final sample because of problems audiotaping her writing session. In order to have an equal number of boys and girls in the sample, the boy who had been used for the pilot study was included. Information regarding the final sample of eight children is presented in Table 3.1. Pseudonyms have been given to both the children and their teachers in order to maintain the participants' confidentiality.

Table 3.1

Background Information on the Subject Sample

Subject	Age	IQ[a]	Reading Percentile[b]	Sex	Teacher
Kim	11-10	122	91	Female	Mrs. Scott
Kate	11-6	130	98	Female	Mr. Field
Sue	10-7	125	91	Female	Mrs. Scott
Colleen	12-3	110	83	Female	Mr. Field
Steven	12-0	112	83	Male	Mrs. Scott
Chad	11-8	127	80	Male	Mrs. Scott
Gary	11-11	111	80	Male	Mrs. Scott
Stuart	11-11	111	86	Male	Mr. Field
Average	11-9	119	87		

Note. [a] An average of verbal, quantitative and non-verbal IQ's as measured by the grade 6 level of the _Canadian Cognitive Abilities Test_ done two months previously.
[b] As obtained on the comprehension measure of the _Elementary Reading Survey Test: Grade 5_ administered one year previously.

The average age was 11 years, 9 months, with one subject being a year younger as she had been advanced early in Grade 3 to Grade 4. All of the subjects had above average IQ scores on the grade 6 level of the Canadian Cognitive Abilities Test (Wright, 1980). Five children were from Mrs. Scott's class and three from Mr. Field's. There was an equal number of boys and girls.

Sixth graders who were both good readers and good writers were selected for this study for several reasons. First, it was recognized that sixth graders would likely have greater metacognitive awareness and would be more capable of verbalizing about their reading and writing processes than would younger students. Brown (1980) has shown that metacognitive awareness at the passage level may not emerge until the upper elementary years. Schumacher and Martin (1984) found that 12 year olds provided longer protocols than did 10 year olds. They interpreted this as "a growing awareness of potential problems in the text" (p. 281).

Second, it was felt that good readers and writers would be better able to verbalize about their processes than would less able language users. Hare and Smith (1972), in reviewing the literature, concluded that studies "generally demonstrate developmental increments in children's metacognitive awareness or differences in metacognitions as a function of reader proficiency" (p. 157). In their own study, they found that the number of reading strategies mentioned by sixth graders was positively correlated with scores in reading achievement.

Equally important to the selection of sixth graders are developmental shifts in the focus of print processing. Shuy (1981) suggests that the beginning reader's focus is upon decoding at the word level, with comprehension at the discourse level becoming the focus in upper elementary grades. Graves (1983) describes a similar pattern for writing: the initial focus is on handwriting, spelling and grammar, while the organization and expression of a message become focal later on. Chall and Jacobs (1983) and Shanahan (1982) have demonstrated that the basis for the relationship between reading and writing changes developmentally from the word to the discourse level.

Since reading and writing were defined in this study as meaning-making, problem-solving processes, it seemed appropriate to select a grade level where these processes would be the main concerns of the subjects. At the time when subjects were selected, reading instruction had traditionally been given a higher priority in early grades than had writing instruction, which had been emphasized more in upper elementary. As well, in order to compare reading and writing processes, it was necessary to consider a grade level at which children's competency in writing would be approaching that in reading.

Data Collection

Each subject attended separately a reading session and a writing session. The sessions were tape recorded as he or she thought out loud while reading a story and while writing one. The subject was then asked to review what he or she had been thinking when first reading or writing the story. Before beginning the target story, the subject was given experience thinking aloud on a practice story. To describe the context of these sessions and to provide verification data, an interview was also conducted with each subject as well as with his or her teacher, notes were made on personal journals and cumulative files, and the teachers were asked to describe their Language Arts programs.

Introspective and Retrospective Techniques

Nisbett and Wilson (1977), who reviewed numerous studies in cognitive psychology, cast some doubt upon the validity of using self-report data to study cognitive processing. They concluded that subjects cannot directly observe their own cognitive processing; however, they can report accurately about those processes under certain conditions. These conclusions were accommodated by Ericsson and Simon (1980) in their development of a model for using verbal reports as data. They described conditions under which verbal report data could be obtained reliably.

Through a review of research, they postulated that minimizing the elapsed time between the processing and the self-report would increase the validity of the data. Also, they found it was more valid for a researcher to infer processing from think-aloud protocols than to use probes that might suggest processes to subjects. They explained that through much practice, some processes can become automatic. They are performed rapidly and possibly simultaneously with other processes. Since they do not enter short-term memory, they are unavailable for verbal report. Ericsson and Simon further showed that cognitive processing would not be affected by thinking aloud when subjects verbalized about what they were attending to. However, if asked to discuss processes that could not be consciously attended to, subjects would infer rather than remember the processing that occurred.

These researchers also indicate that subjects report selectively from what is available to them in short-term memory. Yet they state: "Incompleteness of reports may make some information unavailable, but it does not invalidate the information that is present" (p. 243). Finally, they conclude that verbal report data provide valuable information when interpreted with careful consideration of the conditions under which they were obtained.

In the reading and writing fields, Steinberg (1985) argued for the use of protocol data to build theoretical models of the cognitive processing involved in writing. Olson, Duffy and Mack (1984) supported use of think-aloud protocols to infer higher-level reading processes such as inferencing, predicting, and elaborating schema. Comparing think aloud data with sentence-by-sentence reading times, Olson (1983) was able to support a relationship between the think aloud task and reading without talking.

As already reviewed in Chapter 2, past investigators have made valuable contributions to the understanding of reading and writing processes based on protocols collected both from introspection (thinking aloud while doing an activity) and retrospection (recounting, after-the-fact, one's thoughts while doing an activity).

In studying the connection between the two tasks, Langer (1984) had her subjects think aloud while reading, and then while writing. Half did so introspectively, and half retrospectively. Similarly, in the present study, parallel instructions and interview questions were given to readers and writers in order to compare cognitive processes used in the two language activities. Reading session protocols were compared to writing session protocols for each subject. In each session, which was audiotaped and transcribed, think-alouds were elicited first, followed by retrospective interviews. Using both techniques permitted a more complete collection and interpretation of data than would have been possible using either introspection or retrospection alone.

As described below, the reading and writing sessions were designed to be as parallel as possible.

The Reading Session

Two 450-word stories were selected, one from the grade 5-6 level and the other from the grade 6-7 level Evaluation Resource Book of the Language Development Reading Evaluation Program (Courtney et al., 1980). The stories were intended to be unfamiliar to the subjects, yet similar in style to those found in their readers.

Both stories had a readability level of grade 5 according to Fry's readability formula (1967-68). This formula, however, does not account for the conceptual difficulty of vocabulary or gaps in information at the discourse level. The grade 6-7 story, selected to be the test passage, required a high degree of inferencing in order to resolve some apparent inconsistencies in the text. For example, at the beginning of the story, venturers into a deserted castle were found lifeless in front of the fireplace. At the end, the ghost claimed that the venturers had not "stayed around long enough" to help him. One subject questioned how the venturers could be "found" since no one who entered the castle returned alive. Such inconsistencies were considered to raise the readability level of the story to that appropriate for good sixth grade readers. Furthermore, these inconsistencies were expected to elicit some problem-solving processes from subjects.

The somewhat easier grade 5-6 level story was selected to provide a practice passage. It differed from the test passage, which followed the pattern of a ghost story, in that it realistically presented an adolescent's problem.

Each story was prepared by placing 15 red dots at natural "junctures" (Olson, 1979) such as the end of dialogue or a change in setting or events. Dots were typically positioned at the end of paragraphs unless a paragraph was particularly long or short.

The 40-minute reading session began with an explanation of the purpose of the study (see Appendix A), if this was the subject's first session. The subject was then instructed to think aloud whenever he or she could, but to stop and comment at all red dots (see Appendix B). The specific instructions were adapted from Olshavsky (1975) and Olson (1979). After the subject read the practice story (see Appendix D) in this way, he or she was asked to go back over the story and tell all that could be remembered about what it made him or her think about (adapted from Nolan, 1978). Several questions were asked to probe the subject's reaction to "thinking aloud" as well as his or her reading preferences and habits. Some subjects appeared to gain confidence and to talk more freely after this brief interview.

The test story (see Appendix D) was then given to the subject, followed again by a request to go back over what he or she was thinking while reading the story. Further questioning (as specified in Appendix E) probed:

a) the meaning of the story to the subject;
b) what information was considered important;
c) what might have surprised the reader;
d) whether or not the story worked out the way the subject expected or wanted it to;
e) what the subject did when something did not make sense;
f) whether or not the subject usually read stories in the same way;
g) what the subject thought of the story; and
h) what the subject thought made a good story.

The subject was then thanked for his or her efforts in helping with the study.

The Writing Session

The writing sessions varied in length from 75 to 110 minutes, depending on how much and how quickly each child composed. Adapting from Nolan (1978), the subject was directed to talk about the things going through his or her mind while composing a story. The phrasing of these directions was similar to that of the reading session (see

Appendix C). The subject was then given a chance to practice thinking aloud while writing. The topic "Treasure in the Attic" was suggested and a timer was set for 20 minutes. Some children required an additional 5 to 15 minutes to complete their practice stories. This was allowed since interrupting the composing process might affect the subjects' performance on the second story.

The writing session was less structured than the reading session regarding when the subject should speak; therefore, some permissible prompts were prepared for use especially during the practice writing session. These consisted of some general and a few more specific variations of the initial instructions:

Tell me about how you are planning your story.

Tell me what you are thinking even before you begin writing your story.

Tell me what you had to decide there and how you made your decision.

What are you thinking about?

What is going through you mind now?

It was recognized that anything more specific might bias the data by leading the subject to voice certain strategies. Also, prompts were used sparingly to avoid conditioning a subject to speak only when prompted. Nodding and positive comments such as "that's interesting," "sure," and "okay" were often just as useful as prompts for encouraging the children to speak freely.

Upon completion of the practice story, as was done for the reading session, the subject was asked to go back over the story and tell all that could be remembered about how the story was planned and what it made him or her think about. In addition, the subject was asked to explain any corrections or erasures, revealing whether the main concerns were mechanical or semantic. The subject was also asked how the idea for the story developed: was it pre-planned or did it unfold during the writing? Again, as for the reading session, the child's reaction to thinking aloud while writing was probed along with writing preferences and habits.

For writing the second story, a time period of 30 to 45 minutes was suggested, but no timer was set. It was emphasized that a topic could be made up, but three topics were suggested: Hot Air Balloon Ride, Silver Dart, and Wild One. These topics were less likely to suggest a story pattern than "Treasure in the Attic." The intention was to allow subjects to use the pattern they were most comfortable or familiar with and, as in the reading session, elicit some problem-solving processes. However, this approach--together with fatigue after writing the practice story--may also account for some of the decrease in quality from the first to the second story for some subjects.

Follow-up after the writing of this second story was very similar to that of the test story in the reading session. The subject was asked to go back over his or her thoughts while writing the story, then questioned regarding the story's meaning, important information and so on. In addition to those questions asked in the reading session (but phrased in terms of writing), the subject was asked to tell about the idea for the story and where it came from. Again, the child was thanked for helping with the study.

Session Schedule and Setting

All writing sessions were held during the longest period of the day from 9:00 to 10:25, with some sessions running into recess. Reading sessions were usually held from 10:50 to 11:30. However, one was held from 11:15 to 11:55 because of a school assembly.

Thus, sessions were held with two subjects on each of 10 days over a period of three weeks. Half of the subjects wrote in their first session and read in the second; the other half read in their first session and wrote in the second. This was done to control for any practice effect that might transfer from one session to the other.

The researcher sat opposite subjects at a table, enabling a good view of what they were writing. Most sessions were held in the school's spacious infirmary adjoining the school office. Three sessions were held in a small kitchen where the refrigerator was loud and may have been distracting at times. Interruptions in either setting were occasional. Table 3.2 shows a summary of the schedule and settings for the seven children chosen for the final sample. The eighth subject, Steven, participated first in the writing session, then in the reading session, earlier in the pilot study.

Table 3.2

Session Schedule and Setting

Day	Writing Session (9:00 - 10:25)	Reading Session (10:40 - 11:30)	Setting
		Week 1	
Monday	Stuart	Sue	Infirmary
Tuesday	Chad		Infirmary
Wednesday	Colleen	Gary*	Infirmary
Thursday		Kate	Kitchen
		Week 2	
Tuesday		Kim	Infirmary
Wednesday	Sue	Stuart	Infirmary
Thursday	Gary	Colleen	Kitchen
		Week 3	
Monday	Kim	Chad	Infirmary
Tuesday	Kate		Infirmary

Note. *Held from 11:15 to 11:55.

Describing the Context and Gathering Verification Data

In order to develop a profile on each subject, and to describe the context in which students had been learning and in which the study sessions were conducted, several types of data were collected. During the subject's first session, he or she was interviewed about leisure activities, travel and other personal information. The teacher was asked to compare the subject's performance to that which can usually be expected, and was interviewed about his or her Language Arts program. Some classroom observation was done. Subjects' journals and other written works were surveyed, as were cumulative records. The gathering of this data is further detailed below.

Informal Interviews with Subjects

The informal interviews with subjects served three purposes: a) to help put the subjects at ease, b) to provide a break between the practice and the target story, and c) to gather background information. At the end of their final session, subjects were asked to compare the thinking that they usually did while reading to that done while writing, noting both the similarities and the differences. It was hoped that this data would help to verify observations that arose from the analysis of protocols. The following questions were used in the interviews:

1. How did you like talking to yourself as you were reading/writing? Did it help you or did it get in the way? Have you ever done anything like this before? Do you ever talk to yourself when you are reading/writing on your own? What kinds of things might you say?

2. Do you do any reading/writing outside of school for yourself? What kind of things do you read/write? How often do you read/write?

3. What other things do you do in your spare time? Do you play any sports? Do you have any hobbies? Do you watch television? How often? What things have you done with your family? Have you done any travelling? Where have you been? Have you always lived where you live now?

Teacher Information About Subjects

Upon completion of a subject's study sessions, an interview was held with his or her teacher to obtain further background information about the child as a reader and writer. The teacher was also asked to compare the story produced for the study with writing done by the subject in class, thus giving an impression of the validity of that subject's participation. This interview was guided by a set of questions modelled after those used by Nolan (1978). They are found in Appendix F.

The two teachers took somewhat different approaches to the interview. Mrs. Scott came prepared with the student's Language Arts folders and journals which she left to be surveyed. She had also elicited her students' reading and writing interests and habits through a group discussion in order to have ready written responses to some questions. She mentioned that she had not yet done the creative writing unit with the class and so felt somewhat unfamiliar with the students' narrative writing. Each student was discussed for about 10 minutes.

The time spent with Mr. Field was from 20 to 45 minutes per student. Since students composed stories daily for him, he was interested in analyzing the stories written for the study. He also offered the "published" stories of the class, which were read at the end of the study. Discussions with both teachers were particularly useful in identifying students whose writing performance may have been affected by the time pressures of the study session.

Student Journals

A student's journal can be a personal record of his or her daily activities and attitudes, or it can be an unthreatened exploration of creative writing. Some are in the form of diaries; others represent an ongoing correspondence with the teacher.

All subjects in the study made daily journal entries as part of their regular classroom programs. Some entries dated back to October; some dated back only a month or so since one scribbler had been filled and another started. In any case, reading each subject's journal was regarded as an excellent way to become more familiar with the student who had been met but twice. While reading the journal, brief running notes were made concerning family lifestyle, activities that the child was involved in, leisure time spent with family and friends, and the types of writing attempted. Comments about the study itself, or which revealed attitudes towards reading and writing, were noted.

Cumulative Records

A data sheet was devised to systematically collect some pertinent facts from the school records about each subject, including:

- birthdate
- I.Q. Scores
- parents' occupations
- languages spoken
- number of brothers and sisters
- position in family
- years in present school
- residential history
- grades advanced or repeated
- involvement in enrichment and extracurricular programs
- general academic performance
- comprehension and decoding percentiles for the *Elementary Reading Survey Test: Grade 5*

Teacher Interviews and Classroom Observations

General information about the Language Arts program for the Grade 6 classes was partially collected by observing in the total number of dots in each story to 15. The resulting passages were used successfully with Steven who tended to be more talkative than Theresa.

Third, the wording of several interview questions was altered. When asked, "What does the story mean to you?" after writing about a whimsical adventure in a hot air balloon, Theresa imposed a moral on her story: "Means to me not to ask someone to let you up [into a balloon] because you get sick." Because narratives can hold different meanings for different readers, the question was re-phrased to emphasize the individual's perception: "Tell me how the story makes you feel. What does it mean to you?"

As well, Theresa gave a general answer to "what information was important to you?" She was prompted with, "If you were going to underline the most important information, what would you underline?" This prompt was used frequently throughout the study to elicit more specific answers to this question.

The question, "Tell me about the idea for your story and where it came from," was added to the writing session interview since Steven provided some helpful information about his use of background knowledge to compose his story. It also became apparent that, in asking the subject to compare the thinking he or she did while reading and writing, both similarities and differences had to be requested in order to avoid biasing the answer given.

Finally, the decision to survey the student's journals resulted when Mrs. Scott brought Steven's along to the discussion of his performance. It contained a wealth of information, and all the subjects kept journals.

It should be noted that the two pilot subjects responded quite differently to the study tasks. Steven, who was eventually included as part of the study sample, seemed eager to participate and shared his thinking freely. According to his teacher, he inquired about his second turn in the study. Theresa, on the other hand, seemed more concerned about following directions and giving a correct answer. She did not appear to enjoy the sessions as Steven did, and her teacher later remarked that she seemed drained afterward. This indicated the importance of helping subjects to feel at ease and to feel that their honest contributions were much valued.

Treatment of Data

Coding the Protocols

Protocols were divided into clausal units with mazes and false starts bracketed out. Fourteen categories were devised for coding introspective and retrospective think-alouds. Some of these were suggested by the literature; some emerged or evolved as they were tested on several protocols. Each category was further classified as reflecting one of the processes of Planning,

Figure 3.1. Categories For Protocol Analysis

PLANNING	
- Generating Ideas	K - Mobilizing Knowledge
- Organizing	P - Predicting
- Goal-setting	G - Goal-directing (Commenting on procedures, structuring for carrying out intentions) Q - Questioning (Seeking information or reasons)
TRANSLATING/ REFINING A MODEL	S - Selecting a Language Unit SA - Using antecedent language units for comparison I - Inferencing (Interpreting)
REVIEWING	
- Evaluating	D - Expressing Dissonance C, C^+, C^- - Concluding, confirming, disconfirming A - Responding Affectively
- Revising	R1 - Revising a Prediction (Idea Level) R2 - Revising a Word Choice (Expressive Level) R3 - Revising or Reviewing Mechanics (Technical Level) RR - Re-reading or repeating for re-orientation
	NC - Non-contributing Clausal Units (Conventions of story-telling, false starts, mazes, repetitions, hyponymic terms, comments unrelated to task)

Translating/Refining, or Reviewing described in Tierney's model of Figure 2.2. The categories established are given in Figure 3.1. Definitions were written to be used in establishing inter-rater reliability, and were further refined during a training session with the teacher chosen as the alternate rater. Inter-rater reliability is reported following the definitions of the process categories used in coding the protocols.

Below, each category of process used in coding is first discussed generally as one of the global processes of Planning, Translating/Refining, or Reviewing. Then it is defined specifically with examples. The headings for specific categories are followed by the letter(s) used to represent them in the actual coding.

Planning

Planning is pre-writing or pre-reading, though it may occur at any point during the process of making sense. It is setting up to make meaning. It involves the forward-looking processes of setting goals, generating ideas and organizing which are coded here as mobilizing knowledge (Tierney and Pearson, 1984; Olson, 1979; Olson et al., 1981), predicting (Olson, 1979; Olson et al., 1981), goal-directing (Flower and Hayes, 1981; Tierney and Pearson, 1984) and asking questions (Olson, 1979).

Mobilizing Knowledge (K). Any reference to past experience, extra-textual information or a story schema as a source of ideas or language units, or of which the text reminded the subject, was coded as knowledge mobilization. This included any background knowledge referred to as criteria for making inferences and predictions. Background knowledge could include facts as well as perceptions.

For example,

Reading: a. . . . usually ghosts aren't friendly.

b. There always has to be some person that can go in to venture it.

c. . . . something flying around from Tinkerbell or Walt Disney.

Writing: a. I just did of things I like to do, like canoeing or skiing.

b. . . . when you think of monsters, they usually have big jaws and stuff.

Predicting (P). Predicting involves generating a schema or hypothesis. A prediction is a suggestion of what will happen further in the text. Predicting involves divergent thinking concerning what the story will be about; that is, a prediction implies that other alternatives are possible. A prediction is sometimes couched in the form of a question, but generates ideas that go beyond the text processed so far.

For example,

Reading: a. So it sounds like they might be friends, either that or enemies.

b. 'N' if it's acting out uh something that happened long ago and it has to keep acting it out until somebody can break the spell.

Writing: a. . . . maybe she would be mad, but maybe she'd be thankful, too.

b. He's gonna be practicing for a golf tounament.

c. . . . that ball he picked up could go crazy on him or something like that.

Goal-directing (G). Goal directed statements are instructions to the self or comments about the process of making meaning which indicate procedural or structural intentions. There may be a sense of heightened consciousness about the selection of language units to convey a specific message as when the subject begins with "I want" or "I'm going to make . . ." Goal-directing also includes decisions about when to finish processing the text. For example,

Reading: a. I usually get a picture in my mind.

b. . . . unless this is in a different part.

Writing: a. I want to add some adventure to it.

b. I had to tell a little bit of--sort of background about the characters and um how they feel and stuff now.

c. Then I'll tell about one of his dreams.

Questioning (Q). A clausal unit was coded as questioning when it was either a question or an implied question, such as those beginning, "I wonder why . . . , " which seek information rather than generate ideas. The content of a question comes directly from the text. No predictions or inferences are made.

For example,

Reading: a. I wonder what a tinker is.
b. I'm wondering if he does um banish the ghost.

Writing: a. Now what should they do now?
b. How're they gonna get out?
c. How'm I gonna get there?

Translating/Refining a Model

With regard to writing, Flower and Hayes (1981) describe translating as "the process of putting ideas into visible language" (p. 373). The reader must translate the surface text back into meaning by analyzing and associating meaning with the language units provided. Tierney (1983) refers to this as the refinement of a model of meaning. Since writers are believed to alter personal meaning as they attempt to associate it with language, the term "refining" is used throughout the present study to refer to this global process in both reading and writing. Three types of clausal units appeared to be evidence of refining: selecting a language unit, using an antecedent language unit, and inferencing (Olshavsky, 1975; Olson, 1979; Olson et al., 1981).

Selecting a Language Unit (S). In writing, selecting a language unit is to give a linguistic representation to the meaning intended. In reading, it is selecting surface text to analyze and associate meaning with. In writing, the subject may report aloud what he or she intends to write down or is writing. Sometimes a prediction or generation of ideas seems to occur simultaneously with and is thereby subsumed by the selection of the language unit. Likewise, as the reader selects portions of a text to re-read or re-tell and to discuss, it can be assumed that that portion of the text has been analyzed and some meaning associated with it. This process includes synthesizing elements of text in a simple, non-interpretive way. That is, the language selected is "from the story."

For example,

Q S
Reading: Why would he go in there/ if a villager said/ he
S
wouldn't come out alive?
S S
Writing: Joanne says (. . . says)/ "I'm so nervous!"

(The subject said this while writing the same words.)

Selecting Antecedent Language Units (SA). A subject may refer to antecedent language units to compare previously processed text to immediate information in order to test consistency, to make predictions or inferences, or to draw conclusions.

For example,

NC S S
Reading: You wonder,/ when he says/ that none of the
D
others stayed around long enough/ what they
SA
did,/'cause their bodies were found dead./
P
Writing: . . . while Diane--X me--was probly (just going
to)--not gonna run over and jump all over it
SA
first/ 'cause she wasn't very adventurous./

(The subject previously described the character as being "sort of bored with adventures.")

Inference. An inference is an interpretation that uses background knowledge and therefore goes beyond the text already processed, whether it be oral or written "text". An inference is a "hypothesis about what is happening now" (Brown & Palincsar, 1982, p. 24). It may or may not appear to be true to the intended meaning, but is evidence that the subject is actively using background knowledge to further translate the text that has been analyzed.

For example,

Reading: a. . . . it kinda gave me a picture of a dark
castle with cob webs all over the place, you
know, and he's walking through. 'N' then he

comes to this huge room 'n' he--'n' there's this fireplace over in the corner. . .

b. So probly started to look a bit spooky when he got in there, but a little less as he lit the fire.

Writing: Diane was sort of um mad at Sue . . . so um she was yelling at Sue." (Subject was explaining her dialogue.)

Reviewing

This is the backward-looking process of taking another look at the text for the purpose of evaluating or revising it. During evaluation, if meaning-making has been unsuccessful, confusion may be expressed (Olshavsky, 1975; Olson, 1979). Also, the reader/writer may draw conclusions (Olson, 1979; Olson et al., 1981) or respond affectively. Revision may be of three types: revising ideas, word choice, or mechanical details (Flower and Hayes, 1981; Tierney and Pearson, 1983). These last two types of revision are expected to occur almost entirely in protocols from writing sessions. Because subjects were not asked to produce an oral reading during the reading sessions, there are no miscues or self-corrections to compare to the production aspect of the writing sessions. Reviewing can be indicated directly through re-reading.

Dissonance (D). Dissonance was defined for the purposes of this study to be a detection or perception of inconsistency. It is represented by an expression of confusion or failure to generate a consistent prediction to make sense. This includes admissions of inadequate background knowledge. Occasionally, an inconsistency is expressed as a question at the end of processing the text where more information is not available to solve the problem.

For example,

Reading: a. Talkin' about a brave and jolly tinker, but I don't know what a tinker is.

b. I'm totally confused.

NC
c. And I wonder/ how the other ones--if they
P D
killed themselves/ or if--or what happened
SA
to them/ 'cause they were all found dead.

Q D
Writing: a. How're they gonna get out?/ I don't know./
K D
Um, stay tuned until next week./ Um, not sure.

D
b. I couldn't think of anything else . . .

Concluding (C, C+, C-). A conclusion is indicated by confirmation or disconfirmation of a prediction or inference. No new prediction is made by the clause, but recognition is made that a previous one works (C+) or doesn't work (C-). Such a conclusion may subsume the selection of a language unit as in example d below. The conclusion may be neutral (C) when the prediction is being monitored as in: "Nothing happened to him yet."

For example,

Reading: a. I was right. (C+)

b. But then it didn't. (C-)

c. I knew . . . (C+)

d.
C- NC
But when he started a fire,/ I thought/
R1
well, he must be really gonna stay.

Writing: a. I'm not really sure yet. (C)

b. And then for sure I was gonna have it like/ it would really happen . . . (C+, P)

c.
NC
Right now I was thinking/ (that)--that he'd
P P
pick up the ball/ and he'd be commited for a crime of stealing./ But (I--I kind)--I
C-
decided against that./

Responding Affectively (A). Statements involving feelings or subjective judgements about the text were coded as affective responses. This could include identifying with characters to imagine "what if it was real?"

For example,

Reading: a. it's not too thrilling or interesting

b. Some of the things that the tinker said were humorous.

c. I hope the guy enjoyed his supper.

d. It's kind of a weird story.

e. I'd like to be one of the adventurers.

f. I'd be pretty alarmed.

Writing: a. How it would feel to really be either Sue or Diane . . .

b. Then at the end of the $\overset{S}{\text{story,}}$ Sue thanked Diane/ because she learned her $\overset{S}{\text{lesson/}}$ and $\overset{A}{\text{that's}}$ good./

c. I thought $\overset{A}{\text{it'd}}$ be kinda neat/ for it just really $\overset{S}{\text{to}}$ be his mother's arm--his mother's hand/ $\overset{S}{\text{who}}$ was shaking him.

Revising a Prediction (R1), Word Choice (R2), or Mechanics (R3). Revision of a prediction or inference involves a change of content-goals at the level of schema or idea generation. Revision of word choice does not change the intended message, but rather the way in which it is expressed. The unit of language initially selected is changed.

Revision of mechanics involves changing the technical aspects of spelling, punctuation, capitalization, indenting, omissions, etc. Included here are the few cases where the subject discussed any technical aspects in order to avoid confusing mechanical concerns with meaning-making processes in the coding. In cases where revisions are embedded in clauses that fit other categories, they are indicated by square brackets.

For example,

Reading: . . . a brave and jolly tinker doesn't really
C-
sound like an angel or a fairy or anything,/
R1
so--probly a person./ Then (he)--he earned a
S
few pennies in the market place,/ so he's
C+
definitely a person now--person.

P G P
Writing: a. if he won,/ I was gonna have/ him go to
C-
Hawaii,/ but instead I'm gonna have/ him get
R1
um--get a--his trophy--huh--get a trophy.
S C-
b. Jack was petrified to death/--no--/ Jack was
R2
just petrified.
S [R3]
c. It spoke--it [spoke] to him . . . (The spelling of spoke was corrected.)

Re-reading (RR). Re-reading or repeating for re-orientation to the text was almost entirely restricted to writing sessions since subjects were not asked to produce an oral reading during reading sessions. Any re-reading done during think-alouds in reading sessions was considered to be a selection of language units with which to associate meaning. Rather than employing re-reading as part of the comprehension process of reading, subjects appeared to be making a conventional reference to text in the course of explaining to the researcher.

Non-contributing Clausal Units (NC)

Clausal units coded as non-contributing included mazes (um, uh), false starts, hyponymic terms (lacking content), repetitions, and conventions of speech and story-telling such as: "It says," " I thought," "I wonder," "I guess," "it sounds like," and "that's it." "Okay" was generally coded as non-contributing as the study was not designed to be sensitive enough to the processes implied by this term. Sometimes "okay" is confirmatory; sometimes it signals readiness to begin; at other times it seems to represent a shifting from the general plot to the specific details or vice-versa, or from one process to another--from reviewing to planning, for instance. Also included in this category are comments that are unrelated to the task such as: "Maybe I could publish my own book someday."

Inter-rater Reliability

An elementary school teacher was asked to code the protocols of one reading and one writing session. A training session involved the researcher and teacher using the definitions and rating together clausal units from a reading session and a writing session protocol (using two different, randomly selected subjects) and discussing disagreements. The teacher then independently coded protocols of a reading session and a writing session. These protocols were already divided into clausal units and mazed out. Again protocols from two different, randomly selected subjects were used. An inter-rater reliability of 91% and 90% was obtained for the reading and writing protocols, respectively. Given that the inter-rater reliability co-efficients obtained were within the acceptable range, it was felt that the coding system devised was reliable.

Protocol Analysis

Eliminating the non-contributing clausal units, the eight subjects provided 2,130 clausal units in all: 843 in the reading sessions and 1,287 in the writing sessions. The number of clausal units counted for each category of processes was converted to a percentage to allow for comparisons. Mean percentages and standard deviations were calculated for each process as used by the subject group. Because some information would be lost, introspective and retrospective data were not combined either in these calculations nor in the tables giving percentages of processes used by each subject.

Each subject's processing patterns for reading and writing were compared quantitatively. As well, comparisons were made with the group means. Because of the small sample size, tests of significance and correlation co-efficients could not be calculated reliably. Therefore, one or more standard deviations from the mean was used to indicate differences between percentages. Each subject's percentage of clausal units per process was graphed to provide a visual comparison between reading and writing, and between the subject and the mean of the study group.

In addition to the quantitative analysis, each subject's processing style was described qualitatively with reference to the sequencing of processes and tendencies noted during the sessions. Using the patterns of process percentages and processing styles, a search was made for approaches common to both reading and writing.

Interview Data

Responses to interviews with subjects about their processing were summarized into tables and salient characteristics observed. This data was used to verify and extend the protocol analysis

Contextual Data

The classroom settings were described through teacher interviews and lesson observations to a) provide a sense of the students' environment, and b) to reveal possible influences on processing styles and specific reponses to interview questions.

From the interviews with teachers about each subject, from personal journals and interviews with subjects, and from cumulative files, subject profiles were developed. These were presented to give each subject an identity and to provide comment on the validity of his or her participation in the study.

Summary

This chapter has given justification for using introspective and retrospective techniques to gather data that could be interpreted in terms of cognitive processes. The design of this study used both techniques to gather protocols from eight verbal subjects as they read and wrote. Instructions were kept parallel so that protocols from reading and writing sessions could be compared. A pilot study helped to refine procedures and instructions. Protocols were coded according to processes defined through a review of the literature and through a sampling of the study protocols. To allow a comparison of reading and writing protocol data, processes were defined with reference to Tierney's model. The reliabilty of the coding system was then demonstrated. An account was given of how protocols were analyzed quantitatively as well as qualitatively to look for processing styles common to both reading and writing.

The design included a compilation of responses to interviews regarding subjects' processing in order to provide verification of protocol analysis. A description of the context of the study was provided for through interviews with teachers about their Language Arts programs, through observation of actual lessons, and through the development of subject profiles. It is the context of the study that will be presented in the next chapter in order to provide a background for interpreting the protocol analysis and interview responses which are dealt with in Chapter 5.

CHAPTER 4

DESCRIPTION OF THE CONTEXT OF THE STUDY

This chapter provides vignettes of the sixth-graders' learning environments by summarizing interviews with participating teachers about their Language Arts programs, and by reporting on classroom observations. Following these accounts, data from cumulative files, personal interviews, teacher interviews regarding subjects, and subjects' journals were amalgamated into profiles of each subject not only to assist in verifying processing patterns, but to give identities to the participants of the study.

Classroom Environments

Mrs. Scott

Interview

Provided with the interview questions in advance, Mrs. Scott prepared her answers in writing. She used a thematic approach, integrating speaking, listening, reading and writing. She liked a structured program and so usually followed the themes and reading activities suggested by the texts and workbooks she was using from Starting Points in Language (Cross & Hulland, 1980). These were supplemented with units on current child interests, special occasions, or report writing.

Fifteen minutes were set aside each day for sustained silent reading and/or personal journal writing. A teacher-aide discussed comprehension strategies with a group of four students. Each afternoon, Mrs. Scott read literature to her class for 15 minutes, attempting to make them aware of award-winning novels and other good literature as well as different classifications of books. The students, too, shared book reports of different forms including book covers, mobiles, and newspaper reviews. Those who read enough of the nominated novels were allowed to vote for their choice for the Alberta Book Award.

The first 40 minutes of each day were spent on creative writing, sentence skills and spelling. Mrs. Scott used Spelling in Language Arts (Kuska et al., 1976) and a pre-test, study, post-test approach. She also integrated words from other subject areas. Writing activities were often based on the theme being studied and included writing paragraphs (eg. descriptions, explanations, comparisons, sequences, predictions, feelings and opinions) and a variety of genres (eg. science fiction, fairy tales, tall tales, animal stories, invitations, letters, outlines, reports, poetry, plays, and skits). She observed the students to enjoy creative activities, especially long-term projects. They preferred these projects over working on specific skills and mechanics, particularly where worksheets were involved.

The librarian was an important resource person for the class. Initially, she spent one period per week introducing the class to new books, authors and library skills. The students then used a pass when they needed to exchange books. The librarian also cooperated with Mrs. Scott in developing a unit on science report writing.

Mrs. Scott's classroom was in a portable crowded with 31 desks. However, students did get into small groups sometimes to discuss or plan ideas and to share their writing.

Observation

In Mrs. Scott's classroom, desks were arranged in five rows with her desk at the back. Shelves along the side were labeled for the different subject area texts as well as for journals, Language Arts folders, and reading and language duo-tangs. Informational posters on the metric system, geometry, drugs and endangered species were displayed. News articles were posted for civic, provincial, and federal governments. A colorful spring bulletin board included students' illustrated blurbs on the best things about spring as well as their art work. Another wall displayed CHOICES--one page by each student about the junior high school he or she had selected. A Book Nook at the back contained a class library, and passes to the school library which could be used once weekly by each student. Students' research reports in illustrated covers were displayed here.

Mrs. Scott opened the lesson by having students brainstorm their background knowledge related to the story they would read. She selected the story, "The Horse that Played the Out Field" from Starting Points in Reading C (Cross & Hulland, 1980) on the basis of the children's current interest in softball. Following brainstorming of animals with unexpected talents, she had students recall what they knew about tall tales, then ask ten questions about the things they would like to find out about in the story. While reading, they were directed to think of five fairly hard questions that they could "stump the class" with. They were also reminded to look up new words in the dictionary. After the story had been read, some of their questions were shared, the story was judged against the criteria for a tall tale, and students were asked how they liked the story.

At this point, several students left for their French class. The remaining students shared sequels they had written the previous day for another baseball story. Listeners gave positive comments and used details to defend the story against Mrs. Scott's inquiry into internal consistency. She also praised the use of "sound words" as previously discussed by the class.

The lesson proceeded with a discussion of a Peanuts cartoon in terms of sportsmanship and the value of playing vs. winning. Opinions and evaluations of personal sportsmanship were generated. This was followed up by having small groups of three or four prepare and share skits on given situations.

After morning recess, some students engaged in silent reading while others wrote in their journals. Discussion of the horse story was completed and lead into a story writing project. Again, children brainstormed the pets they had and special tricks that animals could do. The third draft of their "tall tale" was to be written on "tall" paper--two full scap sheets pasted together. Mrs. Scott encouraged them to plan good beginnings, endings and middles before writing, and to double space so that words could be added. She also asked them to edit the story on their own first before exchanging it with a partner, and reminded them to check the ideas, then the mechanics. After posting some checklists, she circulated to conference with individuals about their stories. Most completed the rough draft by the end of the class.

Because the checklists given by Mrs. Scott used terminology that subjects echoed in their interviews, they are reproduced here:

Form

1. Have I tried different sentence beginnings?
2. Have I used different kinds of sentences?
3. Have I tried to avoid run-on sentences?
4. Have I tried to avoid short, choppy sentences and sentence fragments except for special effect?
5. Have I used dialogue correctly?
6. Have I used a variety of joining words? (also, since, when, so, but, before, etc.)
7. Have I started a new paragraph for each new idea?
8. Would my title make a person want to read my story?

Ideas

1. Have I used my own ideas?
2. Have I invented interesting and different characters and setting?
3. Have I repeated only for special effect?
4. Have I tried hard to think of the very best describing words?
5. Have I included enough detail?
6. Have I remembered the people who will read my story?
7. Have I really tried to understand how my characters feel?
8. Do I try to write different kinds of stories? (tall tales, fantasy, writing from another point of view)

Mechanics

1. Spelling
2. Punctuation
3. Capitalization
4. Indenting for each new paragraph and each new speaker
5. Handwriting
6. Neatness
7. Spacing; margins

Mr. Field

Interview

Mr. Field liked the thematic approach to Language Arts and used both Starting Points in Reading C (Cross & Hulland, 1980) and Toboggans and Turtlenecks (McInnes & Hearn, 1973) as a source of the one to two stories studied each week. He liked to introduce the purpose for reading a story through questioning, then follow-up with questions to develop recall and comprehension skills. Drama activities were limited by his small space in the open area of the school. He preferred to teach novel studies, though apparently he hadn't done so with this class yet.

While Mr. Field claimed that teaching Language Arts was not his strong point, he held the popular philosophies of the area. Speaking of the students, he stated that, "They have to have the opportunity to read lots and write lots at levels they are competent at right now." He explained that the teacher's job was to challenge them and help them grow at their own rate.

Mr. Field was also most enthusiastic about the conference approach to writing that he had implemented over the past three months since taking a workshop. Students wrote for 45 minutes daily, in addition to journal writing. Initially, they had a free choice of topic three times a week, and Mr. Field selected the writing activity twice a week. Eventually, he selected the topic only once a week, if at all. He used Write Again (Booth, 1983) as a resource for modeling and developing activities that had not yet been tried or that corresponded with his reading activities.

Mr. Field felt that sharing their writing made students more aware of an audience. Sometimes they read their stories to small groups of grade 2 children, but shared in their conference group weekly. They could edit and "publish" anything they wished, writing the good copy in pen for the typist. At the end of June, all published works would go into a class book. Every six weeks, students selected their best work for evaluation on an analytic scale. Keeping the writing folder permitted students to go back and recognize their growth. Some students involved in the enrichment program (including Colleen, Kate and Stuart) were using their stories as a basis to develop frames for a film.

Rather than writing a formal research report, Mr. Field's students had done a creative writing report called an Island Research Project. The project involved making up their own island for which they created a poem, a story, a brochure, letters, and an outline. In their creative writing, they had covered development of setting and action, but had yet to explore character development.

No spelling text was used. Instead, some words were selected from their reader for study. Primarily though, misspelled words from their writing were listed on a page stapled to the back inside cover of their writing folders. When 15 words were collected, the students used each in a sentence, studied them, then got into partners to test one another. Any missed words were written five times and appeared again on the next word list.

Mr. Field observed students becoming more competent, unafraid and confident in their Language Arts. They missed sharing their work if not able to. As they became writers, they began to question their reading materials, discussing styles, forms, word choice, characters, setting, plot and sequence. Perhaps due to the great amount of oral reading done in group writing conferences, he had found improvement in their listening skills.

The librarian was used by this class as she was by Mrs. Scott's.

Observation

Mr. Field's was a small classroom partitioned off in the open area of the school. Thirty-one desks were arranged in three blocks of four desks in depth. Each block was two to four desks across. The teacher's desk and a table holding a box of student journals was at the back of the room. One wall was an exhibit on China, an exploration into how China and Canada solve their problems. Another bulletin board displayed current events articles classified as local, national, or international. Each student had a shelf for his or her belongings, above which was a class library of books. This class, too, was involved in the Alberta Book Award program. In one corner were instructions for making kites and an "events" sheet for the Science Olympics which Mr. Field had helped to organize. Kites and cubes were everywhere in the room ready for entry that day.

The afternoon lesson was opened by explaining that today's story ("The Sneaker Crisis" from Starting Points in Reading C) tied in with their unit on "Everyone's Wearing It". Students described and interpreted a picture that introduced the theme, predicting the story behind it. A student was chosen to read the introductory paragraph of the story, then several told of their related experiences. After students read the next few paragraphs aloud, a vocabulary item was discussed as was the style of the writing (which was disjointed to represent someone thinking aloud to himself). Each student then wrote five questions they would like to have answered by the story. The class finished reading the first two pages orally and the remainder of the story silently, writing answers to their questions as they found them. Then, they each wrote a "stump the class" question.

Later, Mr. Field commented that his approach to the reading lesson varied. A greater portion might be read orally, the predicting might be done orally, questions might be presented on the board, or students might discuss the story in groups.

When all had finished reading, Mr. Field asked for the students' reaction to the story, and told which parts he found humorous. Literal questions were asked followed by sharing the prediction questions and answers to "reveal the level of thinking while reading." Inferential comprehension was probed, particularly as the outcome of the story was ambiguous.

Following recess, students wrote in their journals for 5 minutes. Mr. Field then shared several poems from Where the Sidewalk Ends (Shel Silverstein), promoting The Light in the Attic by the same author. He explained that poetry is shorter, more precise and has less description than prose, so demands more attention but allows one to draw one's own conclusions. Apparently, he shared literature daily with his class at this time.

The remainder of the afternoon was spent in writing. Part of the class had written an ending to a story in the morning which they were expected to proofread before going on to their personal writing files. A minimum expectation of 22 lines was set in order, as he later explained, to give reluctant or less able writers a sense of success as well as the volume of practice they needed.

The Wednesday conference group of four students met at the back, sitting in a circle. Each was asked to read a page or more of what they were working on, after which the others commmented positively on details and choice of words. Mr. Field asked for more description of the setting from one student, and whether all listeners had understood the "sophisticated" words used by another. At the end of the lesson, Colleen commented, "The reading group is interesting, eh? I like doing that."

Subject Profiles

In this section, an attempt is made to briefly portray each subject as an individual. His or her nature, interests and habits, as revealed through mid-session interviews, personal journals, and cumulative files, are described. Stories written for the study were read by each subject's teacher who was asked to comment on how typical the stories were of writing done by the subject in class. Thus, the profiles include an impression of the validity of each subject's participation in the study.

Kim

Kim was the youngest of three children, and quite close to her mother, who sometimes helped at the school. She was involved in jazz dancing, art and modeling lessons, the enrichment program, and liked to play a variety of sports such a golf, softball, soccer, ice hockey and street hockey. She also liked to crochet, draw cartoons, ride her bike, and watch television with her family for about one hour each day.

In her journal, her moods swung from high, when she wrote about these involvements, to low when she discussed social and diet concerns (she was petite). She also wrote stories and poems in her journal, stopping near the beginning of one story to research some background facts.

Kim's teacher described her as an A student who was quite concerned about achievement. She would often complete writing assignments at home and even ask for help or extra worksheets. She was an avid reader who could read a book in one day, and who read at least one hour per day in her free time. She liked fiction such as Sweet Dream Romances, Judy Blume, Norma Klein, and Beverly Cleary. She also wrote for her own enjoyment outside of school, preferring to write poetry or stories over formal writing. Her stories were usually about children her own age dealing with realistic problems.

Her teacher, Mrs. Scott, felt that the practice and target stories Kim had written for the study were fairly typical of her work. She noted her usual attention to adverbs, adjectives and specific detail in these stories.

Kim had indicated during the reading and writing session that talking out loud was "kind of neat," saying after reading that it was harder than she expected, but saying after writing, "it helped me to see what I was going to write on as I continued." She did not talk to herself at all when reading or writing on her own. In fact, she worried about the reading session when she wrote about it in her journal: "I don't talk to myself when I read so that made it hard." This suggests that Kim was eager to participate "properly" in the study, but that perhaps she lacked confidence in this less structured study situation.

Kate

Kate was the youngest of five children in her family. Academic study was stressed in the home, and Kate was an A student. Her journal indicated a supportive family network as she mentioned writing letters to many relatives and receiving one from her grandmother after a visit to Spain. (Kate referred to this in relation to the ghost story of the reading session.) She enjoyed collecting stamps, playing softball and frisbe, bike riding, skateboarding, swimming, canoeing at their cottage in Winnipeg, and kayaking at her sister's near Athabasca. She was also involved in the Glee Club and was a student helper with A. V. equipment and patrolling the playground.

Kate's journal entries were a rich mixture of comments, observations, and judgements about activites and events. She inquired about class assignments and the purposes of several activities. She reported on books she was reading, making observations and sometimes predicting their outcomes. (She read one or two books each week, preferring mysteries, adventures and animal stories.) She wrote enthusiastically about the mystery stories she had written in class, and about her ideas for new stories. She evidentally had come to see herself as a writer when she wrote of a novel she was reading: "If I ever write a mystery book, I'd make the ending not so obvious."

Finally, Kate's journal entries revealed a curiosity about and a positive attitude towards her participation in this study. Having read the permission letter, she wanted to know if "think aloud" meant "to say everything I'm thinking when I'm writing." After the study, she described the session as "neat" and "different".

Mr. Field described Kate as a competitive individual, an independent worker, a good problem-solver, and a sophisticated writer. She was currently working in an enrichment group with Colleen and Stuart on filmstrips of their stories. Discussing her writing, he noted her good descriptive language, sentence structure and dialogue. He liked her "tidy style" of using quick starts to involve characters in a conflict, and having good finishes. She visualized well, and used her experiences (such as the canoeing and skiing episodes of the nightmare she created in her target story). He felt that her practice story was typical of the mysteries she liked to write, while the target story copied the style of the fantasy adventures that some of her classmates had been experimenting with. In fact, the story written by Colleen for the study had the same nightmarish quality.

Generally, then, the writing session seemed to fairly represent Kate's processing and story products. Though she didn't usually talk to herself while reading, she claimed that it wasn't hard and she would say the same things in her head. However, during the writing session, she was somewhat concerned about forgetting to think aloud and said that thinking aloud got in the way of her writing sometimes.

Sue

Sue was an A student who had been advanced after the first term of grade 3 to grade 4. Thus, she was a year younger than the other subjects in the study. She was looking for a junior high school placement that would involve her in extended French and accelerated mathematics. She had a brother in kindergarten, and her journal gave evidence of activities enjoyed with her parents. She also appeared to be quite sociable as she mentioned her friends often in her journal and was described as "people oriented" by her teacher. Sue was taking organ lessons and had had lessons in ballet and figure skating. In addition, she enjoyed swimming, baseball, and rollerskating, and had travelled to California, Hawaii, and Florida. She liked several comedy programs, but did not watch much television.

Sue's taste in books included autobiographies, romances, Judy Blume, and Norma Klein. She claimed she often read a book in a day, trading novels with her friend. Occasionally, she wrote stories at home for her own enjoyment, but usually completed her writing assignments easily within the time given at school. She like writing about young people her own age and about the future. She preferred to write stories rather than poems, and fiction rather than non-fiction. Her writing file, containing book reports, a story, a play and a twelve-page research report on planets, revealed few mechanical errors and equal facility with expository and story writing.

Mrs. Scott felt that the practice story was particularly typical of her writing, although Sue may have been tired from the previous day's field trip. She described Sue's writing as colorful with good use of adverbs and adjectives. She handled all writing assignments well, giving elaborated answers to comprehension questions and writing stories of a longer length than her classmates.

Sue appeared to give a good effort during the study sessions. Asked how she liked talking while she read, she described it as "different". After writing, she said it was "weird" and "got in the way". She never talked to herself while writing, but might read aloud to herself to "get the words through my head." She was evidently aware that different readers would be likely to interpret the study story differently.

Colleen

Colleen was a tall girl with long red hair. While her teacher claimed she was not an athletic person, she described herself as active. She enjoyed basketball and soccer, as well as badminton and baseball "on the side". She took piano and swimming lessons, and was involved in Girl Guides. She liked comedy programs and usually watched about three hours per day of television.

Mr. Field's impression that Colleen was considerate of others--a "general citizen" who was "cheerful" in the classroom--was borne out in her interview and journal. She made pleasant conversation in her journal, often commenting positively on books she had read, books Mr. Field had read to the class, shows, and the ballet. With regard to this study, she inquired, "Why was I picked to go with that lady?" She later thanked her teacher for the compliment in his written reply that she wrote and read quite well. In subsequent entries, she mentioned letters she had written and new ideas for stories. Her journal was always written in pen or felt, perhaps reflecting the aesthetic appeal of writing to her.

The importance of her family was clearly emphasized throughout her interview. The family had moved back to Edmonton when she was in grade 3 after several years in Fort McMurray. Besides other family activities mentioned, Colleen's mother liked to read to her and to her younger brother who was in grade 4. Colleen herself enjoyed reading to her brother and correcting his vocabulary while he read to her. Though she wasn't one to read a newspaper, articles about the family would interest her.

Colleen read a wide variety of books (one or more each week) including mysteries, adventures and spooky stories. She had collections of Judy Blume, Nancy Drew, the Hardy Boys, and Reader's Digest which she enjoyed for its drama and real life stories. She didn't seem to choose animal stories. Colleen liked to write the same kinds of things that she read. She claimed to write "quite a bit" outside of school, especially poems for her uncle to read. She also wrote several stories and had one published in Owl Magazine.

Through a number of Colleen's comments, it became apparent that she thought always with the attitude of a writer. After telling about her interests, she volunteered: "So, sometimes when I'm writing stories I put all these things in my mind . . . . I write them all down, so it kind of evolves around me and my friends." She mentioned twice that when reading a book, she liked to add her own ending and also that she would sometimes take notes on a book to use in other stories. On the reading interview, she claimed she might use re-writing to solve a problem of meaning-making in reading. She sometimes got ideas while predicting the outcomes of television programs or just before going to sleep.

Mr. Field described Colleen as an A student--a superior reader and writer. As a writer, though a careless speller, her generation, structure, and editing of ideas was quite mature. For instance, she was able to use a delay technique to leave a reader in suspense. Her sentence structure was good and her dialogue accurate. She used tags well to add to the story action and to reveal character development.

Colleen's participation in the study would seem to have represented her writing processes quite well. Reading her work and thinking aloud sometimes helped her to figure out what to write when writing at home. She felt, however, that thinking aloud while reading slowed her down as she liked to think about a story or chapter after reading it.

Nevertheless, she claimed to say the same kinds of things in her mind as she said in the study and admitted that she did sometimes amuse her brother and scare the cat with her interjections while reading at home. Her recognition of the study story may, however, have affected the proportion of time she spent on certain processes. Colleen was a verbal participant with the self-confidence to have a positive attitude toward sharing her thoughts. Her request to have a copy of the stories she wrote further revealed her commitment to the tasks.

Steven

Steven was the only child of a single parent family which had moved around the city several times. He was nevertheless part of a close family unit. His rather personal journal entries revealed the importance to him of his mother and aunt, who provided or shared books and assisted with the mechanics of his writing, and of his grandfather and uncle with whom he went swimming or ice fishing "in the North". He was a child of slight stature and unidentified health problems. Steven's interests ranged from sports (basketball, baseball, football, and golfing) to his collection of 58 smurfs, to playing Trivial Pursuit or computer strategy games, to detective and comedy television programs (he watched a good deal of television after school). He took calligraphy lessons and a babysitting course. He was also involved in the school's enrichment program, enjoying French and computers.

Steven's journal indicated his concerns and anxieties about school tests, timetables and homework. He often wrote of the books he was reading and even mentioned using a dictionary throughout the reading of one difficult story, which validated his claim on the reading interview that he used a dictionary when something did not make sense.

Steven enjoyed reading adventures and had read his mother's complete collection of J. R. Tolkien books. Yet, his reading interests leaned toward non-fiction. He had his own collection of mammal books, and was fascinated by the Guiness Book of World Records, the World Almanac, and books on his research topics of astrology, hemlock and gamma rays. While he liked to read during any spare moment in class, he was more likely to write at home. When asked after the practice writing session how he liked thinking aloud he replied:

> Not bad, because like I usually always do it. . . . When we're in class and we're asked to write a story or something like that, I try and get it for homework . . . . Then when I get home, I just go into my room and I work at my desk and I do my story. And then I usually talk to myself or my cat and go, "Curious, how do you think about that?"

He felt that he needed a lot of time for writing, and Mrs. Scott confirmed that he took his writing assignments home to finish them. He had also written stories for his own enjoyment, particularly during vacations. While on a fishing trip, he wrote one about a boy who ran away and survived partly by fishing. On a travelling vacation, he created the story of a detective (himself) in a car following a secret agent from place to place. He liked to write fiction (adventures, comedy, or sports stories), and used his own activities and friends as sources of ideas.

Mrs. Scott described Steven as a high-average student who was a prolific reader with very good comprehension and who always did his assignments well, gave elaborated written answers, and was quite verbal orally as well. While the class was just beginning to write stories, Steven could generate "innovative, unique" ideas fluently. She noted problems with proofreading, mechanics, and handwriting, but felt he did not usually miss as many words as he did on the target story written for the study and was usually neater. Since he liked to spend time on his writing, she suggested he may have felt the pressure of limited time in the study.

Steven's response to thinking aloud during the reading session included a reference to writing:

> It's different. When I read, I don't like to talk to myself as much as I do when I'm writing. I just read and that's it.

When he did say something aloud, it would usually be to wonder what will happen next. Steven was one of the more confident and verbal subjects in the study who was eager to share his ideas and interests. In general, it would seem that his participation probably represented his usual processing well.

Chad

Chad was the older brother of two sisters. The home environment was described by Mrs. Scott as "supportive" and "encouraging". Chad's mother sometimes volunteered at the school. He had relatives in the city and grandparents in Vancouver whom he visited frequently. In his journal, a close relationship with his father was evident in the time they spent together practicing hockey and golf, and in the purchase of a family motorboat. Chad had been involved in powerskating, skiing, and the track club, and he had a paper route as well. While he enjoyed sports, he had been excluded from some teams, for instance baseball, because of his small size. He liked to play cards or board games wih his sisters, but watched little television because it conflicted with his homework. He did watch hockey games with his father and Walt Disney on Sundays with his family. He particularly enjoyed computers which he became exposed to through the enrichment program he had been part of since grade 3.

Generally, Chad's journal was a report of his activites with few affective or evaluative comments attached. The predominant impression was that he was always quite busy. There appeared to be a great deal of concern over homework in the winter months, and he seemed bored and worried about what he would miss at school when he was sick at home.

Chad indicated that he preferred to read non-fiction, yet he enjoyed mysteries and adventures such as The Hardy Boys and Nancy Drew, and demanded excitement in his reading. He had re-read some books two to four times. He enjoyed free reading and did so for 30 to 40 minutes at home daily. A recommendation in one of his book reports is suggestive of his approach to reading: "I think others would enjoy the book because . . . it lets the mind wander."

Chad's writing interests were similar. He liked to write mysteries and adventures about younger children or those a bit older than himself. He completed most of his writing in class, as he preferred to be active after school. The previous year, he had thought of an idea for a story, but still had not "gotten around to writing it down."

Asked about thinking aloud in the study compared to his every day reading and writing, he felt it "takes quite awhile" to read that way. He said, " I usually just read through and understand as I go." He did not usually talk to himself while writing, either, although he did admit to "muttering" when he was thinking: "I'm just kind of thinking right out--like I might think of something and then think that something else would be better. So I put the better thing in." Whether thinking aloud or silently, he felt that he thought "approximately" the same types of things.

In his journal, Chad reported quite accurately what he had done in the study, but made no evaluative comments that would reveal his attitude to it. Indeed, he may have been tired by the practice writing session as his target story paled in comparison to his practice story. The practice story was more typical of his writing, according to Mrs. Scott. It used detail and dialogue tags well, included humor, had a plausible conclusion and showed a good sense of story development. The second story lacked variety in word choice and sentence structure, and had few specific details. It is interesting to note that both of Chad's stories were family-oriented with a pre-occupation for bettering the family's finances. Reference was also made to the importance of the reward in the ghost story that he read.

Mrs. Scott saw few mechanical concerns in Chad's writing, allowing him to concentrate on ideas. She claimed he was an all-round student, both academically and as a school citizen. He improvised well in drama.

As Chad was confident and eager to share his thoughts, it was felt that his processing was probably adequately represented in the study sessions. The decrease in the quality of his writing from the practice to the target story must be kept in mind as this may have translated into less variety of processes represented by his writing protocols.

Gary

Gary was the fifth child in a family of six which was spread out from Regina to the West Coast where he lived before moving to Edmonton in grade 2. Hence, the family did a good deal of travelling. Attending the christening of his niece in Calgary, and visiting his sister in Regina and his grandmother in Brandon, were mentioned in his interview and in his journal. He also wrote of his parents' travels to Vancouver and Arizona that winter, and of a friend's vacation in Hawaii. Gary travelled himself to Calgary and Vernon for swimming competitions. Other interests were playing football and soccer, watching three or four television programs nightly, and drawing cartoon characters.

His journal was a report of events in his life, with very little commentary or emotion attached, as seen in his reading and writing protocols. Yet, his enjoyment of humor was demonstrated in a story written over six entries in his journal. The first "chapter" included a joke, and the chapter titles reflected the comical tone of the adventure. Unlike many of the other subjects, he did not write about books he was reading or his school assignments.

Gary read in his leisure time for about 30 minutes daily and would read more on vacations. He liked "fun" or "scary" books, science fiction and mysteries (his favorite). He enjoyed non-fiction about science and space, and read the front pages, sports and comics of the newspaper. Gary indicated that he would also write in his leisure time, usually while on vacation. He produced comic strips, sent letters, or wrote funny stories for himself and his younger brother. Besides comedy, he liked to write drama-adventure and creative stories.

Mrs. Scott described Gary as a high average student (he was not in enrichment). She said he was a fluent reader with good comprehension, but he could sometimes have supported his answers more fully. As a writer, he had little difficulty getting his ideas down and staying on topic, but might have mechanical problems. The length of his stories varied with his interest in the topic. Aside from his carelessness in omitting some words (because he was writing quickly for the study), Mrs. Scott felt that the stories he produced were typical of him. The practice story was about a boy playing a joke on his brother, and the brother's revenge. It had a somewhat stronger story line and resolution than the target story which contained no humor but was instead a drama-adventure that allowed him to be creative about survival tricks.

When asked during the study sessions how he liked talking to himself while reading and writing, he answered positively. For reading, he said, "Oh, pretty neat. It kind of helped me to understand the story a bit more." Furthermore, despite the fact that no affective responses occurred in either his reading or writing protocols, he claimed that he might sometimes talk out loud to himself when he is leisure reading:

> Like in a book there, where people are getting hurt because they're--they're just standing there and--innocent--I feel kind of mad at--and I yell something like "that stupid guy."

For writing, he claimed to say the same types of things that he said in the session, but in his head and not aloud. About the thinking aloud, he did say:

> It makes me think more and I seem to get a story more than I did if I . . . wasn't talking. . . . It seems to come out more better.

From Gary's positive attitude to the study, his teacher's judgement, and types of stories he was asked to read and chose to write, it would seem that his participation in the study reasonably represented his processing.

Stuart

Stuart was a middle child, having an older brother and a younger sister. His was a family that enjoyed outdoor activities together such as camping in Jasper, fishing, skiing, skidooing, and sight-seeing. Suart was tall and enjoyed playing football and baseball, but felt he did not have time for these given the amount of school work he had. More recently, he had been break dancing with an informal group at the shopping mall. He had his own computer and enjoyed playing video games. Comedy and news programs on television interested him; the supernatural intrigued him.

When Stuart could think of nothing to write in his journal, he told jokes, or created mathematics puzzles for Mr. Field. Stuart's journal was actually a series of notes to his teacher. He expressed positive affective responses to his writing and reading that were not represented in his study protocols. He recommended books and particularly liked writing in the folders and sharing his work with his conference group. He also expressed his concerns about finishing assignments on time.

Stuart read adventures and mysteries, but preferred non-fiction such as information about U. F. O.'s, sports books and computer magazines. He read two or three times each week, usually before bed. He tended to write mysteries and adventures that were usually completed in class. His stories were often long, like the 14-page video-game fantasy he spent two weeks producing. In the enrichment program, Stuart was making a filmstrip of this story.

Mr. Field placed Stuart among the top 10% of the class in overall ability. He was a better silent than oral reader, but had very good comprehension. He saw him as very vocal in expressing his opinions during debates. Yet, Stuart felt that thinking aloud during writing was "embarrassing" and made it "hard to write". Mr. Field observed that, though he was definitely a story writer, Stuart was not a spontaneous writer. He needed time to look back, add detail and revise. Stuart did indeed re-read his work often in the study. The practice story was more typical of Stuart's writing than the target story as it contained more description of the setting, more antecedent action and more detail. Mr. Field noted the good use of phrases and character development in Stuart's writing.

Stuart claimed that he never thought out loud either when he read or wrote. When writing, he might think in his head about how to "get to the climax of the story," how to let the reader know about the characters, how to spell a word, or how to write a sentence so that it makes sense. While the processes of goal-directing, questioning and expressions of confusion were represented by his writing protocols, a richer pattern may have developed had he been more comfortable thinking aloud or had he more time for reviewing processes. For reading, he felt that thinking aloud was easier, though he claimed that he usually thought about what goes through his mind after reading stories. Unlike thinking aloud for the writing, for reading he said:

> It sort of helped me understand the story more, I guess. Sort of helped me get rid of what I had inside like questions. If I wanted to ask questions, could ask it.

Stuart's negative responses to the interview question, "Do you usually read/write stories the way you did this one?" together with the small number of protocols provided and his teacher's observations, suggest that Stuart himself was not satisfied that he had adequately represented his thinking processes during the study. Nevertheless, similarities between his approaches to the reading and writing tasks were evident and worth discussing. Keeping in mind that other processes were likely unrepresented, his tendency to use questioning on both tasks was validated by interview comments.

Summary Comments

Overall, the subjects were a group of children who each belonged to a strong family unit, had varied interests, were prolific readers who did not see reading as difficult, and who enjoyed the challenge of writing. They were generally confident, though often anxious, in their approach to school assignments. Some seemed to be uncomfortable exposing themselves by thinking aloud, while others were eager to participate in the study. All tended to focus on generating ideas rather than on mechanics when they wrote. Some of the subjects may have been tired after writing the practice stories as these were stronger than the target stories for some. Still, it was felt that regardless of the quality of the second story, the protocols obtained from its production would be more true to the subject's processing after having practiced.

All but one subject, Stuart, would appear to have provided protocols representative of their usual reading and writing processes.

CHAPTER 5

RESULTS OF PROTOCOL ANALYSIS AND INTERVIEWS

This chapter begins by presenting and discussing the percentages of protocols obtained in each category of processes. Group trends are first analyzed, followed by the results obtained from each of the eight subjects compared to the group means. Unless otherwise stated, any difference from the group mean discussed for a specified process is at least one standard deviation above or below the mean for the group (see mean and standard deviation tables in Appendix G). Means and standard deviations for the global processes of planning, refining, and reviewing are found in Tables G-15 through G-17 of Appendix G.

Since the small sample size used in the study precluded the use of tests of significance and correlation coefficients, the percentages for each subject's processes were graphed. It was felt that a visual presentation would facilitate comparison and the recognition of correspondences in this descriptive study. In addition to describing the quantitative patterns of protocols, a qualitative analysis of the sequence of processes was done to give a more complete picture of processing styles.

The second section of the chapter is concerned with verification data. It provides a summary of subjects' responses to interview questions about their reading and writing processes. Main trends for the group are described and specific responses are discussed in terms of insights they give about the validity of an individual's processing patterns. The chapter ends with a discussion of ways in which these sixth-graders' Language Arts programs, as described in Chapter 4, might have influenced their processing.

Protocol Analysis

Group Trends

Combined Introspective and Retrospective Data

Only in Tables 5.1 and 5.2, and in Figure 5.1 are introspective and retrospective data for reading and writing combined. Differences appear in the group for only a few processes. Subjects spent about 10% more of their time in each of predicting and goal-directing during writing than they did during reading. Goal-directing was virtually unrepresented in reading protocols.

Questioning was used slightly more during reading than writing, though an examination of individual contributions shows that six subjects tended to use about the same amount of questioning in both activities, from 0% to about 50%. Two subjects used questioning in reading but not in writing, with Kim in particular skewing the percentages upward for reading.

Table 5.1

Whole Group Combined Introspective and Retrospective Data

Process	Reading	Writing
Planning		
Using Knowledge	6.8	7.2
Predicting	7.7	19.9
Goal-directing	.3	11.1
Questioning	9.9	2.3
Refining		
Selecting	38.1	31.7
Using Antecedents	1.9	.5
Inferencing	18.3	12.9
Reviewing		
Expressing Dissonance	1.5	1.1
Concluding	5.3	2.5
Reacting Affectively	9.3	1.9
Revising Ideas	.6	1.1
Revising Words	.3	3.5
Revising Mechanics		2.1
Re-reading		2.2

Note. All values represent percentages of clausal units in each process category.

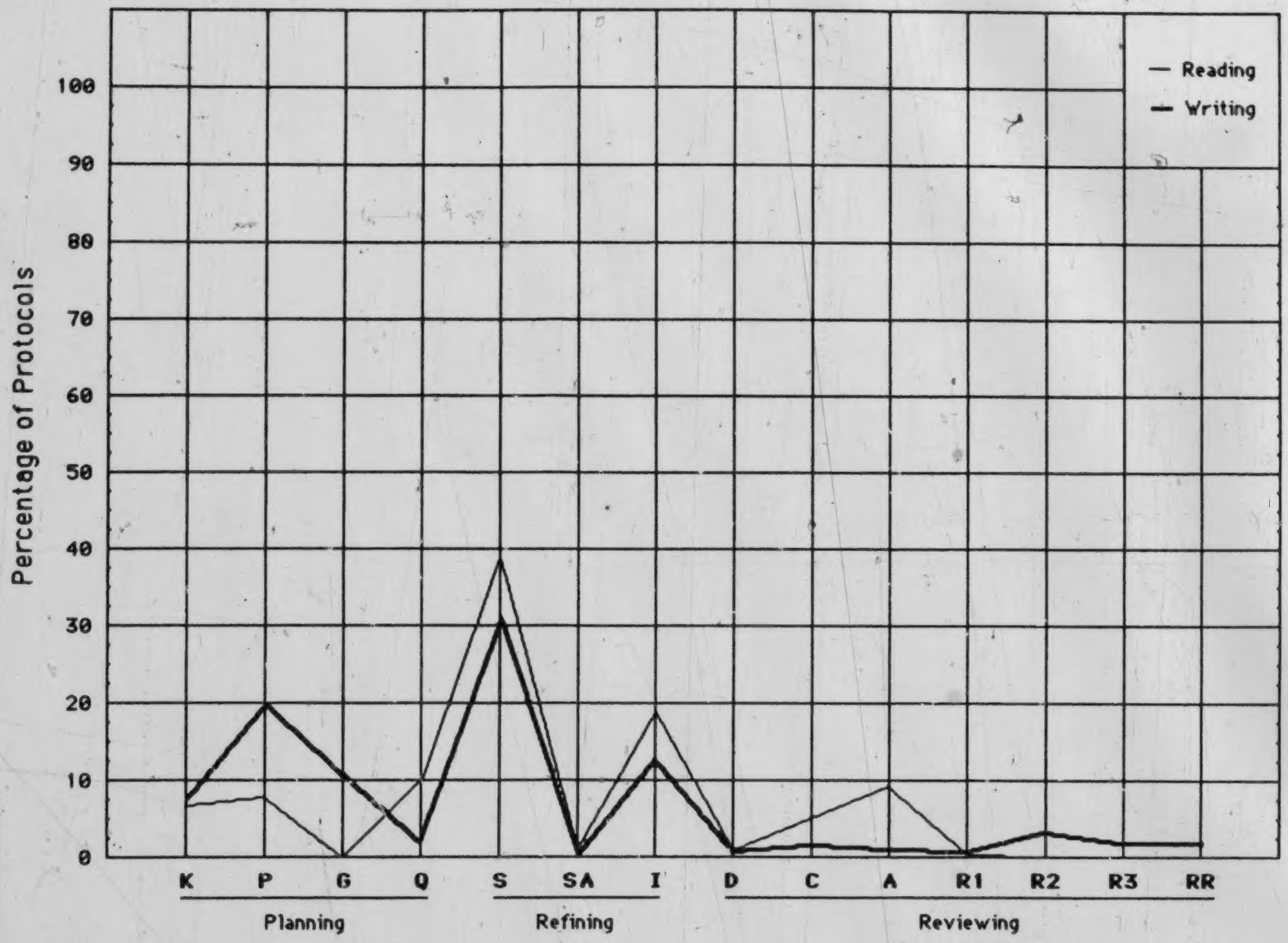

Figure 5.1 Group mean percentages of protocols representing combined introspective and retrospective data for processes of reading and writing.

The small 5% difference between reading and writing for inferencing can be similarly explained. The most influential factor is likely the wide difference between subjects on their style of using inferencing. Subjects with high or low inferencing on reading tended to have a corresponding level on writing. While Chad tended to make more inferences after writing than reading, Sue skewed the reading percentages upwards.

Responding affectively was another area where subjects generally spent from 7 to 15% more of their time during reading than during writing. This seems to represent a real difference between reading and writing. Only one subject in this sample, Sue, had more affective responses to her own writing (22%) than to the ghost story read in the reading session (5%). Two of the boys gave no affective response during either the reading or writing activities.

Another real difference between reading and writing involved the categories of revising word choice, revising mechanics, and re-reading. Subjects spent an average of 8% of their time (the range being from 2% to 21%) addressing these production aspects of writing that were unparalleled in reading because no reading product was required.

For reading and writing, subjects used similar amounts of mobilizing knowledge, selecting language units with which to associate meaning, and inferencing. As well, similarities were represented by the very small percentages obtained in both reading and writing for selecting antecedent language units, expressing dissonance, drawing conclusions, and revising ideas.

Table 5.2 further collapses the data to show a comparison between the three main categories of processes presented in the Tierney (1983) model that serves as the basis for this study (see Figure 2.2). Clearly, the writing task demanded more planning processes from the subjects than did the reading task, while reading involved refining to a somewhat greater degree. Because selecting language units, inferencing and predicting were the three most frequently occurring processes, the refining category described the greater share of clausal units with planning also occurring frequently, especially in writing. Regardless of the fact

Table 5.2

Whole Group Combined Introspective and Retrospective Data for the Main Process Categories

Process Category	Reading	Writing
Planning	24.7	40.5
Refining	58.3	45.1
Reviewing	17.0	14.4

Note. All values represent percentages of clausal units in each process category.

that writing involved some reviewing of the product that was unparalleled in reading (revising word choices and mechanics, and re-reading), reading and writing yielded similar percentages for the processes of reviewing. This is because, as already mentioned, readers evidenced more affective responses and they drew slightly more conclusions than did writers.

Introspective and Retrospective Data Separated

In Table 5.3 and Figure 5.2 some of the differences between the introspective and retrospective protocols are evident. While generating predictions was quite important during the introspective writing sessions, relating the knowledge mobilization that occurred became more predominant during retrospective reports. For some processes, the retrospective report after writing resembled both the introspective and retrospective reports for reading better than the introspection during writing. This can be seen in Figure 5.2 for prediction and inferencing. Perhaps as the writer reviews his or her story retrospectively, and less attention need be given to the mechanical production, he or she takes more of a reader's stance. The only other marked differences occurred on reviewing processes for re-reading and revisions of word choice and mechanics. As expected, these were of more importance during the actual writing, with less attention given them on retrospective report.

Overall, the data suggests that reading and writing do involve related processes in similar proportions, though some processes are emphasized over others depending on the

Table 5.3

Group Mean Percentage of Protocols per Process

Process	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Using Knowledge	5.5	7.1	1.8	20.7
Predicting	5.5	10.1	22.5	7.1
Goal-directing	0.0	.5	9.9	11.1
Questioning	6.0	2.8	1.1	2.5
Selecting	48.7	43.2	33.3	32.1
Using Antecedents	2.6	1.7	1.0	0.0
Inferencing	17.7	19.3	8.3	14.3
Expressing Dissonance	1.4	1.2	.7	2.2
Concluding	4.8	5.9	5.1	3.6
Reacting Affectively	7.4	6.1	1.4	4.0
Revising Ideas	.2	1.4	1.8	1.6
Revising Words	.2	.7	6.6	.7
Revising Mechanics			3.5	.2
Re-reading			3.0	0.0
N	419	424	838	449

Note. Intro. = introspective data.
Retro. = retrospective data.

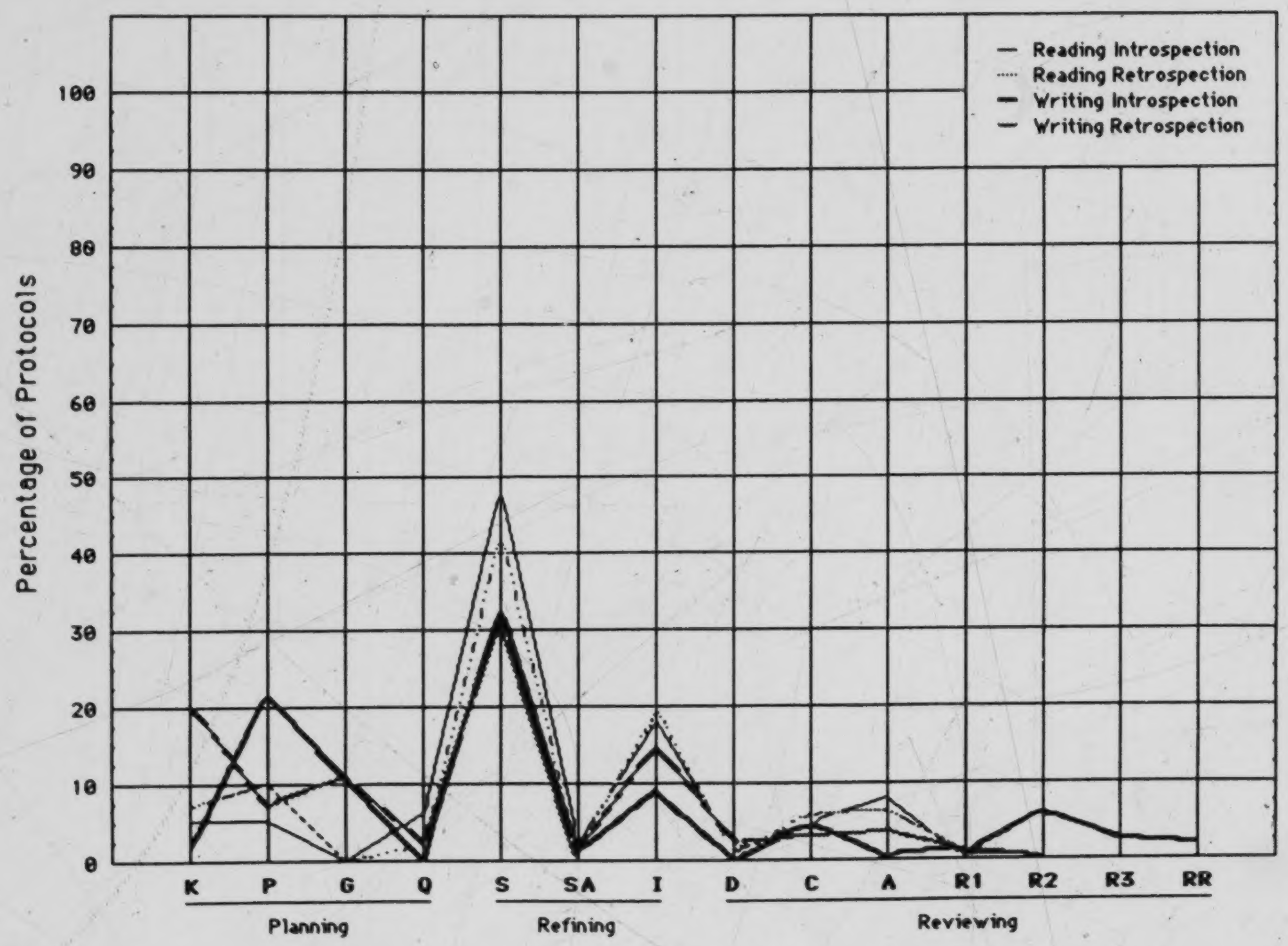

Figure 5.2 Group mean percentages of protocols by introspective and retrospective data for processes of reading and writing.

activity. It was apparent that when introspective and retrospective data were combined, some important information was lost. For instance, reviewing processes were indicated more often while working on a task than afterward, and planning processes were discussed more retrospectively. Hence, retrospective and introspective data were not combined in the following descriptions of the individual subjects' reading and writing profiles.

Kim

Quantitative Analysis

Kim's processing patterns were the most scattered of the group. Table 5.4 and Figure 5.3 show that she used predicting (45% of her introspective protocol) as her primary planning strategy in writing, yet did not use predicting at all during her introspection for reading (below the group mean). Instead, questioning was her primary planning strategy for reading (above the group mean).

For reading, Kim was two standard deviations below the mean for the group on combined refining processes, and two standard deviations above on combined reviewing processes. Compared to the group mean, she voiced a considerably smaller percentage of her selections of language units on all tasks except in her retrospection after writing. Consistent with the mean of the group, inferencing was an important process, but inconsistent with the mean of the group, she made more expressions of dissonance on reading introspection (6% of her protocol). As well, she made over 20% more affective comments about her reading than did the other subjects

Table 5.4

Kim: Percentage of Protocols per Process

Process	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Relating Knowledge	0.0	7.1	4.4*	25.0
Predicting	0.0*	7.1	45.6	12.5
Goal-directing	0.0	0.0	10.3	12.5
Questioning	38.9*	7.2	0.0	0.0
Selecting	5.5*	14.3*	8.8*	37.5
Using Antecedents	0.0	0.0	0.0	0.0
Inferencing	16.6	21.4	22.1	6.3
Dissonance	5.6*	0.0	0.0	0.0
Concluding	5.6	7.2	1.5	0.0
Reacting Affectively	27.8**	35.7**	0.0	0.0
Revising Ideas	0.0	0.0	0.0	6.2**
Revising Words	0.0	0.0	1.5*	0.0
Revising Mechanics			5.8	0.0
Re-reading			0.0	0.0
N	18	14	68	16

Note. Intro. = introspective data.
Retro. = retrospective data.
*1 *SD* above or below *M*. **2 *SD* above or below *M*.

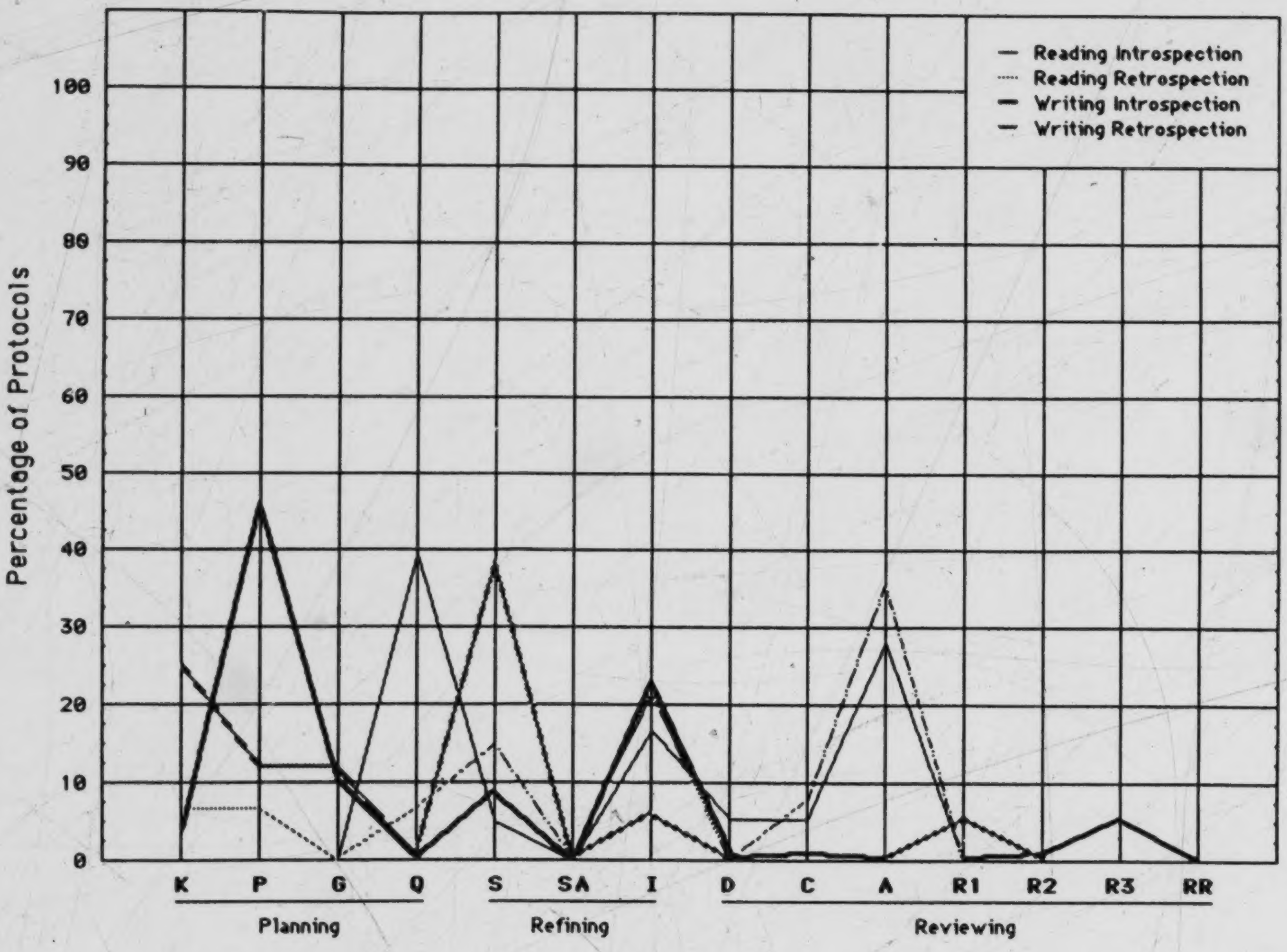

Figure 5.3 Kim: Percentages of protocols given for processes of reading and writing.

(2 SD > M for both the reading introspection and retrospection). Her revision of mechanics was comparable to that done by most other members of the study group. Revision of her ideas while writing was revealed only on retrospection, but at 6% was two standard deviations above the group mean of 2%. In summary, not only did Kim's patterns vary from reading to writing, but also from introspection to retrospection.

Processing Style

In 43 minutes, Kim wrote a four-page realistic story about a young girl being trapped on a hot air balloon. Kim's style of approaching the writing task involved planning (goal-directing and predicting) and inferring character's feelings in chunks, then silently selecting the language units as she wrote. After writing a chunk, she might revise the mechanics before planning the next chunk, but not often. The initial ideas "just came" to her and the rest "fell into place". On retrospection, she indicated some knowledge sources and that she had revised her idea for the ending. At one point in her retrospection, it was difficult to tell if Kim had created one of her characters as an author or had inferred his characteristics as a reader: "I just had an idea that the man at the desk was kind of um rude and that's why he kept on calling her 'lady' and all that."

During reading, Kim asked questions, responded affectively, expressed confusion at one point, and drew some inferences. Any answers she might have found to her questions remained unvoiced. On retrospection, she shifted to affective responses, and her final thought was a prediction about the story's ending: "I wonder if the tinker told the story . . . how it happened."

Overall, Kim's processing patterns for reading and writing were quite different, except perhaps for the process of inferencing.

Kate

Quantitative Analysis

In her retrospective report after reading and while writing, Kate used more planning processes than any other member of the study group. From Table 5.5 and Figure 5.4 it can be seen that predicting was a prominent feature of her processing, particularly while writing. Goal-directing was also important to her writing, though her use of this process was not unlike the group mean. She was also one of the four subjects who used questioning as a reading strategy, especially on retrospection.

In comparison to planning processes, Kate used a smaller percentage of refining processes for writing than the group average. She tended to predict the content of her story in chunks, then silently select language units. In reading, the percentage of language units she selected to associate meaning with, and the percentage of inferences she made, were similar to the means of the group. Her references to

Table 5.5

Kate: Percentage of Protocols per Process

Process	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Using Knowledge	2.7	12.8	2.0	11.1
Predicting	13.5*	20.5*	63.3*	7.4
Goal-directing	0.0	0.0	14.3	14.8
Questioning	2.7	10.3	0.0	0.0
Selecting	32.5	15.4*	8.2*	44.5
Using Antecedents	2.7	2.6*	0.0	0.0
Inferencing	24.3	23.0	4.1	18.5
Dissonance	2.7	2.6	0.0	0.0
Concluding	2.7	0.0*	0.0	0.0
Reacting Affectively	16.2	12.8	0.0	3.7
Revising Ideas	0.0	0.0	2.0	0.0
Revising Words	0.0	0.0	6.1	0.0
Revising Mechanics			0.0	0.0
Re-reading			0.0	0.0
_N_	37	39	49	27

Note. Intro. = introspective data.
Retro. = retrospective data.
*1 _SD_ above or below _M_. **2 _SD_s above or below _M_.

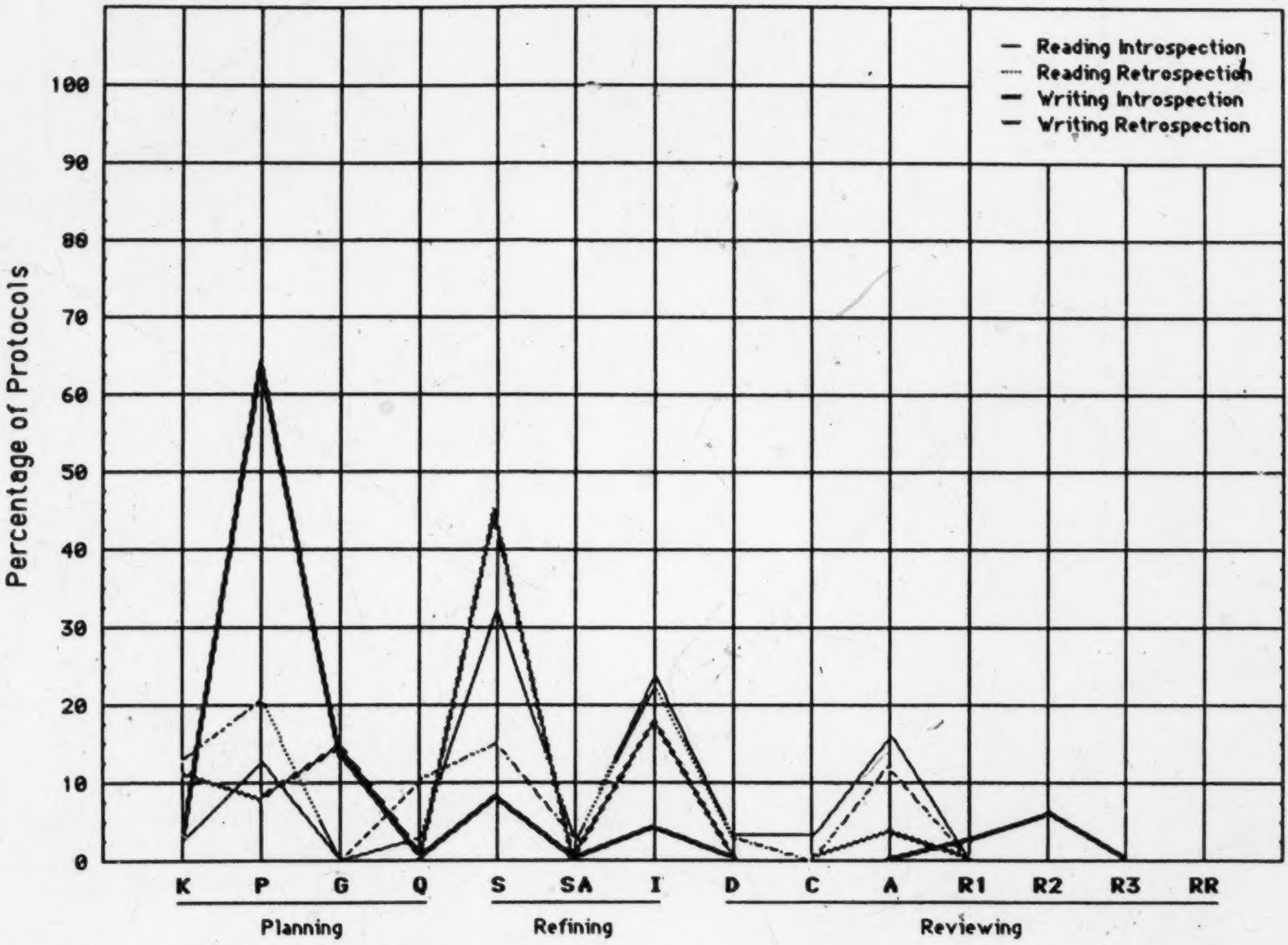

Figure 5.4 Kate: Percentages of protocols given for processes of reading and writing.

antecedent information suggested that she was attentive to the internal consistency of the story she read.

In regard to reviewing processes, Kate did not differ notably from the group average. However, another marked feature of Kate's reading was the 15% of reading protocols that were affective responses. As well, she was the only subject not to represent confirmations or disconfirmations on her retrospective report after reading.

Where similarities between reading and writing exist (only for mobilizing knowledge, predicting and inferencing), they tend to be between the retrospections after writing and both the introspections and retrospections for reading.

Processing Style

Kate's two and a half page story was about a boy's recurring nightmares presented as a series of dream sequences. She produced the story in 30 minutes.

Of her story written in the practice session, Kate commented that she thought of the beginning ideas and the "the ending just kind of grew as I was writing." Her protocol on the target story followed a pattern of setting general goals, predicting or generating ideas in a chunk, then selecting language units silently. She created an inference for her readers at the end. In retrospection, she showed how she selected ideas from her background knowledge and related them to her goals. She also alluded to how she set up inferences and aesthetic experiences of the reader. For example, she was aware of the qualities of a nightmare which she gave to one of the dream sequences she wrote. She explained that she wrote it "so it doesn't really sound like he's going to--the Wild One's going to come in that dream."

In her reading, she appeared to set up affective goals. Her think-alouds were interpretive, predictive, information-seeking and comparative as she tested the internal consistency of the story. Retrospectively, she was again analytical, but shared more of her background knowledge as she related her grandmother's visit to castles in Spain to the same setting of the story.

Kate's writing tended to be a goal-oriented process of generating ideas and revising word choices, while her reading was based on seeking information, associating meaning to language units, extending that meaning through inferencing, and responding affectively to it.

Sue

Quantitative Analysis

Sue's profile was marked by a greater tendency than her peers in the study to discuss her writing goals, to refer to antecedent information, and to make inferences both while reading and writing (2 *SD*s above the mean on reading introspection and writing introspection). In retrospection, she spent 22% of her time telling about her affective responses to her own writing (2 SD > M, M = 4%) compared to only 5% for reading. This was remarkable as even the group average for affective responses to reading was

Table 5.6

Sue: Percentage of Protocols per Process

Process	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Using Knowledge	1.7	11.6	0.0*	8.1
Predicting	3.4	0.0	15.4	0.0*
Goal-directing	0.0	0.0	16.9*	10.8
Questioning	0.0	0.0	0.0	0.0
Selecting	29.3	46.5	26.2	37.9
Using Antecedents	8.6*	0.0	3.1**	0.0
Inferencing	46.6**	34.9*	36.9**	18.9
Dissonance	3.5	0.0	0.0	0.0
Concluding	3.4	2.3	0.0	0.0
Reacting Affectively	3.5	4.7	0.0	21.6**
Revising Ideas	0.0	0.0	0.0	0.0
Revising Words	0.0	0.0	1.5*	2.7**
Revising Mechanics			0.0	0.0
Re-reading			0.0	0.0
N	58	43	65	37

Note. Intro. = introspective data.
Retro. = retrospective data.
*1 SD above or below M. **2 SD above or below M.

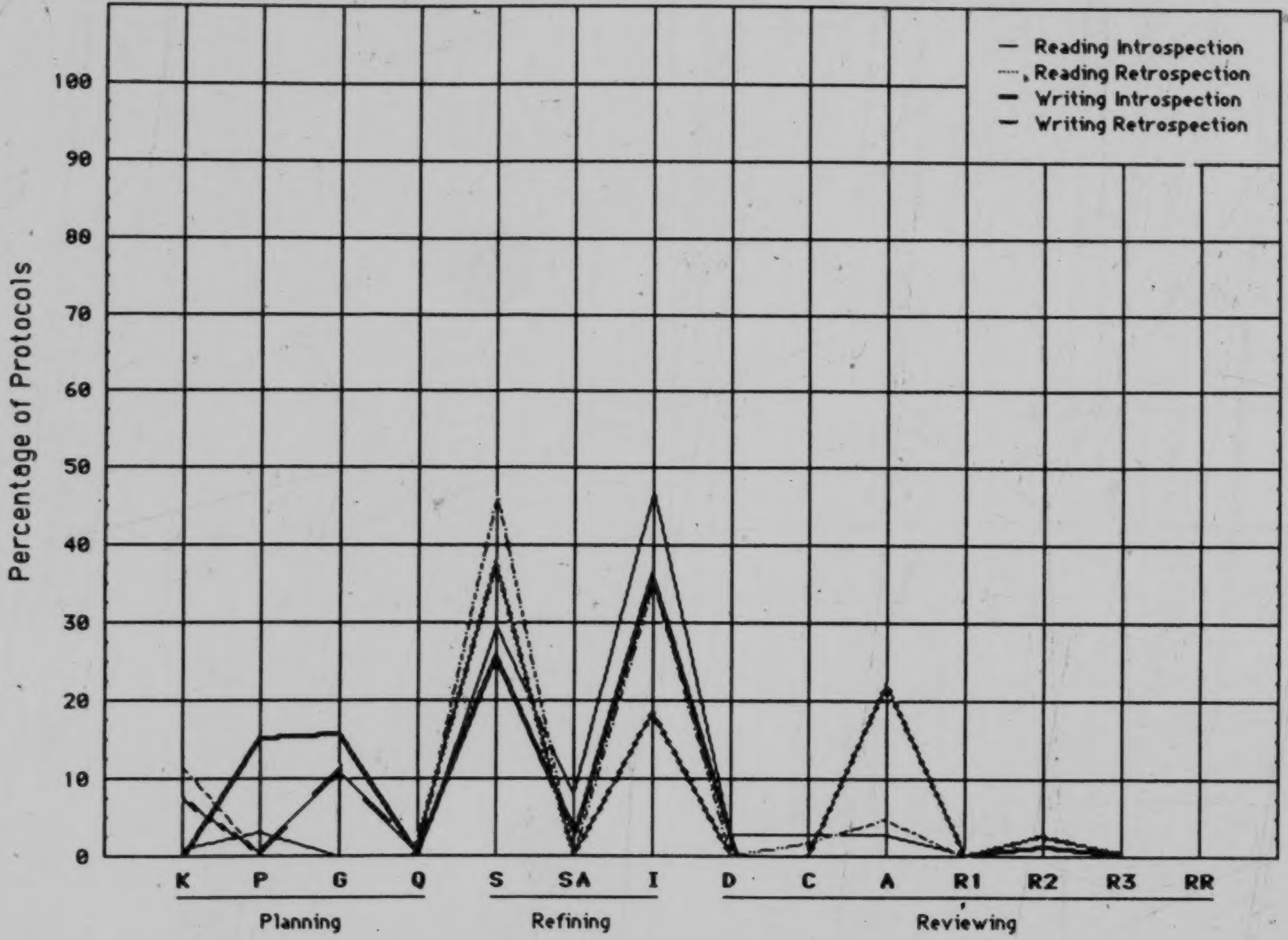

Figure 5.5 Sue: Percentages of protocols given for processes of reading and writing.

only about 9%. It would appear, then, that Sue was quite emotively involved with her text as she reviewed her processing.

While Sue did revise a higher percentage of word choices on retrospection compared to the group mean, in both reading and writing generally, very little revision was done. This suggests perhaps that she was more attentive to interpreting language units, and maintaining consistency between them, than to predicting and confirming in either activity.

Sue's planning processes, then, did not differ greatly from the tendencies of the group. She used refining processes more often, though, due to her emphasis on inferencing. For use of reviewing processes, Sue was below the group mean while writing because she rarely revised, but above the group mean after writing because of her affective responses.

Processing Style

At the beginning of the reading task, Sue assessed her knowledge related to the story. Her reading style was marked by interpretation and testing the internal consistency of the story. On retrospection, she related more of her background experiences and affective responses, but was still predominantly interpretive.

Sue wrote a four and a half page story in 35 minutes. It was a realistic story about an adventurous girl who learned her lesson after being trapped in a hot air balloon. During the writing task, she also tended to interpret her language selection for the researcher. That is, she may have been setting up inferences for the reader. She was goal-oriented, working from her character introduction to the conflict, and deciding on an ending later in the writing. She thought aloud and wrote in chunks rather than giving a steady narrative of her processes. She attended to the internal consistency of her own story as well, and was observed to re-read several times though this was not represented in her protocols. As in the retrospection for reading, her retrospection after writing included more background experiences and a great deal more affective responses. There appeared to be a high degree of correspondence between Sue's styles of processing on the reading and writing tasks.

Colleen

Quantitative Analysis

Colleen's apparent recognition of the specific ghost story or story type used in the reading session caused her to associate much background knowledge to the story (38% of her introspective protocol), far in excess of the group average (2 *SD* > *M*, *M* = 5%). Like most of the subjects, though, she voiced little background knowledge mobilization while writing, but instead discussed this more on retrospection. Too, she made more affective responses for reading than for her own writing.

It is noteworthy that Colleen's writing protocols exemplified every process defined by this study. The mismatches with reading on knowledge mobilization on

Table 5.7

Colleen: Percentage of Protocols per Process

Process	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Using Knowledge	38.3**	4.7	1.1	14.4
Predicting	8.5	0.0	16.8	19.2*
Goal-directing	0.0	4.7**	12.3	17.3
Questioning	0.0	0.0	.7	1.0
Selecting	23.4	34.9	33.0	17.3
Using Antecedents	6.4*	2.3	1.8	0.0
Inferencing	6.4	27.9	.7	5.8
Dissonance	0.0	4.6**	.3	3.8*
Concluding	6.4	2.3	10.9**	11.6**
Reacting Affectively	10.6	18.6	3.9**	5.7
Revising Ideas	0.0	0.0	4.2**	2.9
Revising Words	0.0	0.0	8.4	1.0
Revising Mechanics			2.1	0.0
Re-reading			3.9	0.0
_N_	47	43	285	104

Note. Intro. = introspective data.
Retro. = retrospective data.
*1 _SD_ above or below _M_. **2 _SD_s above or below _M_.

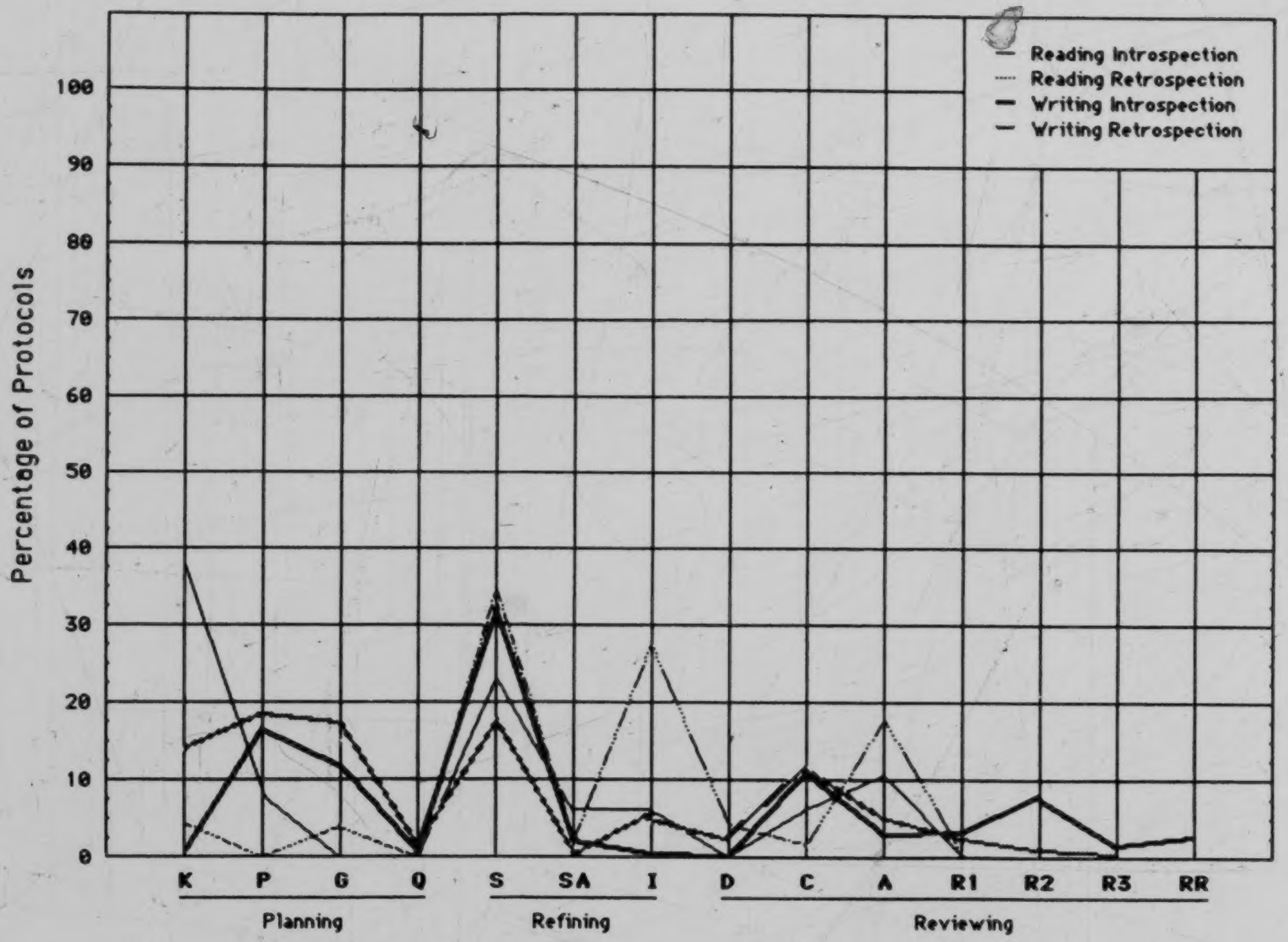

Figure 5.6 Colleen: Percentages of protocols given for processes of reading and writing.

introspection and prediction on retrospection may be due to the familiarity she claimed to have with the story in the reading session.

Nevertheless, for Colleen, both processes involved predicting (above the group mean on writing retrospection only), confirming or disconfirming (2 SD > M for writing at about 11%), revising predictions, and responding affectively (each at 4% and 2 SD > M). She was the only subject to represent goal-directing in reading as well as in writing. She also attended to the internal consistency of stories while she read and wrote, and expressed her confusions in both retrospective sessions. Though represented by less than 5% of her protocols, they were each at least one standard deviation above the mean. Thus, Colleen's percentages for processes differed from the group means on several variables, particularly on planning processes while reading and on reviewing her writing, and yet her reading and writing styles were similar.

Processing Style

Colleen wrote fluently a three and a half page story in 25 minutes. The story dealt with the supernatural and had a nightmarish quality. She did not begin the story with a clear vision of the ending, but wrote as it came to her and changed her goals after writing the introductory paragraphs. Not only did she do chunks of planning before writing, but she also provided an account of language selections and revisions as she wrote. Her writing style was characterized by revision of ideas through the generation of less common alternatives. She set goals, made predictions, disconfirmed her predictions, revised her ideas, re-read, selected the language, and revised her wording. She often expressed affective responses to her goals and choices.

Though not always represented in her think-alouds, Colleen was frequently observed to re-read before selecting language units, seemingly to maintain the flow of meaning or to solve problems of choosing or revising the wording. She periodically referred to a previously selected language unit, suggesting that she was attentive to the internal consistency of her story. She seemed to have a good short-term memory as she remembered her language selections through explanations of her predictions and revisions. On retrospection, the pattern was similar with more reference to her knowledge sources.

While reading, Colleen initially selected language units to interpret. She confirmed her interpretations and responded affectively. Because she came to recognize at least the structure of the ghost story, she then related a good deal of the story she thought she had read before (background knowledge). Towards the end of the reading, she began to criticize the internal consistency of the story.

On retrospection, she returned to the interpretive pattern and again the story failed to meet her criteria for coherence and affective appeal. Of note, she explained how she used imagery as a reading strategy.

Besides the affective responses and tendency to draw conclusions, the approach to processing most common between reading and writing for Colleen was referring to antecedent units to test or maintain consistency. Twice as much of her time was spent reviewing while writing than was spent while reading. Perhaps this is because excellent prediction skills precluded the need for much revising during reading, yet allowed her to generate many ideas to choose from for her own writing. Consistent with her tendency to choose less common ideas for her own writing, she indicated that she was bored by common structures or predictable stories.

Steven

Quantitative Analysis

From examining Table 5.8 and Figure 5.7, it can be seen that Steven's pattern was much like that of the tendency for the group, but with several processes being exaggerated in one of the think-aloud protocols. For introspecting while reading, his pattern was nearly identical to that of the group's. On retrospection, he reported more knowledge mobilization, confirming and disconfirming, but less inferencing than the group average.

During writing, he made 17% fewer predictions than the group average, and fewer goal-directing statements, but made more revisions of word choice and mechanics (2 SD > M).

Table 5.8

Steven: Percentage of Protocols per Process

Process	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Using Knowledge	3.7	14.3*	3.5*	42.8**
Predicting	3.7	16.7	9.9	0.0*
Goal-directing	0.0	0.0	5.8	1.0*
Questioning	3.7	1.2	3.5**	0.0
Selecting	53.6	42.9	49.4	44.8
Using Antecedents	1.2	1.2	0.0	0.0
Inferencing	17.1	4.7*	2.9	5.7
Dissonance	0.0	0.0	1.2	1.9
Concluding	7.3	10.6*	5.8	0.0
Reacting Affectively	8.5	6.0	0.0	1.0
Revising Ideas	0.0	0.0	1.2	1.0
Revising Words	1.2**	2.4**	10.5*	1.0
Revising Mechanics			3.5	1.0**
Re-reading			2.9	0.0
N	82	84	172	105

Note. Intro. = introspective data.
Retro. = retrospective data.
*1 SD above or below M. **2 SD above or below M.

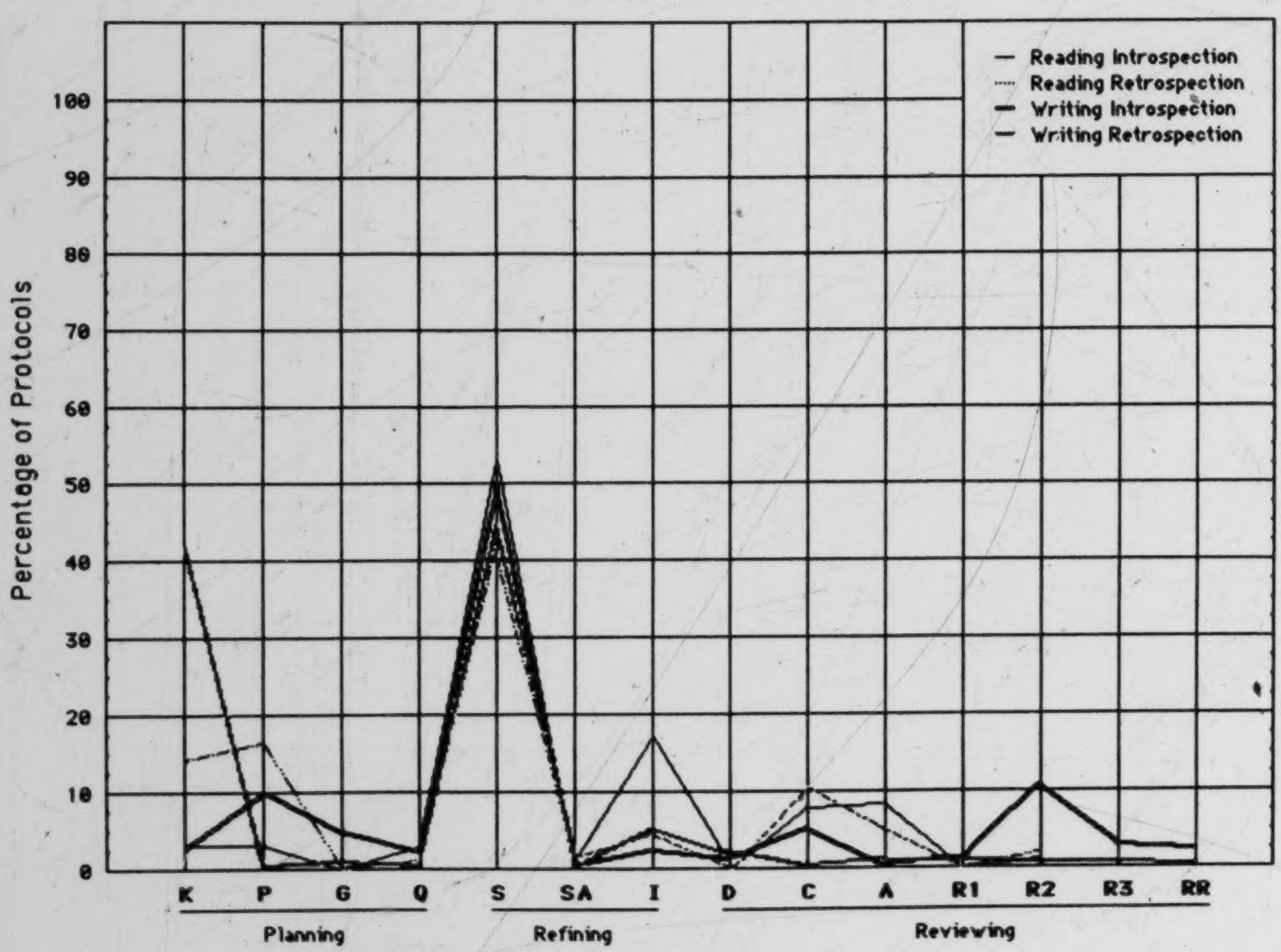

Figure 5.7 Steven: Percentages of protocols given for processes of reading and writing.

During retrospection, a very high proportion of knowledge associations were reported (2 SD > M), while no predicting was recalled (1 SD < M). Despite these differences, on the global processes of planning, refining, and reviewing, Steven did not differ from the group means for either writing or reading.

Comparing reading to writing, he mobilized more knowledge after writing, but made more predictions during reading. He used questioning as a strategy in both activities, but used inferencing much more during reading than after reading or for writing. His protocols were also marked by the amount of confirming and disconfirming he did during both activities.

Processing Style

Steven's target story was one and one half pages of crowded handwriting about a hot air balloon race adventure. He completed it in 30 minutes. Steven began with general goals for the story, then generated a specific beginning. Thereafter, goal-directing statements occurred periodically throughout his protocol. He wrote in small units, both predicting the ideas and selecting the language units orally. Revisions of word choices were numerous, and attention was given to revising mechanics as well. When at a juncture of events, he was particularly likely to stop to organize and explain his ideas. He often gave asides to explain the sources of his ideas or language selections, which also formed the main pattern of his retrospection. On retrospection, he indicated some of the inferences that he seemed to expect readers would make.

While affective responses were almost unrepresented by Steven's writing protocols, they were certainly present in his reading protocols. Indeed, he seemed to change his reading goals from a search for the resolution of conflict (predicting and inferencing) to an appreciation of the humor. His reading style was to select language units for retelling but to which he could also attach his own meaning. That is, his reading style was predominantly interpretive, but he also questioned, predicted, drew conclusions, or associated with his background knowledge. On retrospection, his background knowledge and confirmations or disconfirmations of predictions were the main focus. He also made an attempt to prove the internal consistency of the story.

In both reading and writing, Steven made use of some questioning, which was unrepresented for half of the subjects. He used a high degree of either predicting or inferencing together with confirmations or disconfirmations in both activities. While no specific goal-oriented statements were made for reading, a clear shift in his goals for reading was evident. This suggests that he is highly goal-oriented in both reading and writing. The processing similarities between reading and writing for Steven were more apparent than the differences.

Chad

Quantitative Analysis

Chad's pattern of processes was quite comparable to that of the overall group. He did produce about 20% more predictions during writing, but this is still within 1 standard deviation of the group mean. For reporting knowledge mobilization after reading, he was below the group mean, reflecting lower than group average planning processes on reading retrospection.

Chad's selection of language units during writing was almost entirely unvoiced whereas the group average was near 33% of protocols. Instead, he tended to refine his story on introspection through inferencing (2 SD > M). Curiously, in Figure 5.8 his highest peak for inferencing is for retrospective reports after writing, being 5% higher than that for retrospective reports after reading. It seemed he was explaining and justifying the story he wrote by filling some gaps in his text. He attempted to maintain consistency between ideas in the ghost story as revealed by his references to antecedent information on retrospection, and also made one such reference while writing his own story. He may have been extending beyond his initial concepts of the story as he did for the ghost story he read. Overall, Chad spent more time than did the other group members reporting his refining processes after reading and writing.

Table 5.9

Chad: Percentage of Protocols per Process

Process	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Using Knowledge	0.0	2.4*	1.2	20.2
Predicting	4.8	4.9	46.4	0.0*
Goal-directing	0.0	0.0	7.1	5.6*
Questioning	0.0	0.0	0.0	0.0
Selecting	63.9	51.2	3.6*	33.7
Using Antecedents	1.2	3.3*	1.2	0.0
Inferencing	14.5	29.3	21.4	34.8**
Dissonance	2.4	1.6	1.2	2.3
Concluding	4.8	4.9	1.2	1.1
Reacting Affectively	7.2	.8	1.2	2.3
Revising Ideas	1.2**	.8	0.0	0.0
Revising Words	0.0	.8	1.2	0.0
Revising Mechanics			14.3**	0.0
Re-reading			0.0	0.0
_N_	83	123	84	89

Note. Intro. = introspective data.
Retro. = retrospective data.
*1 _SD_ above or below _M_. **2 _SD_ above or below _M_.

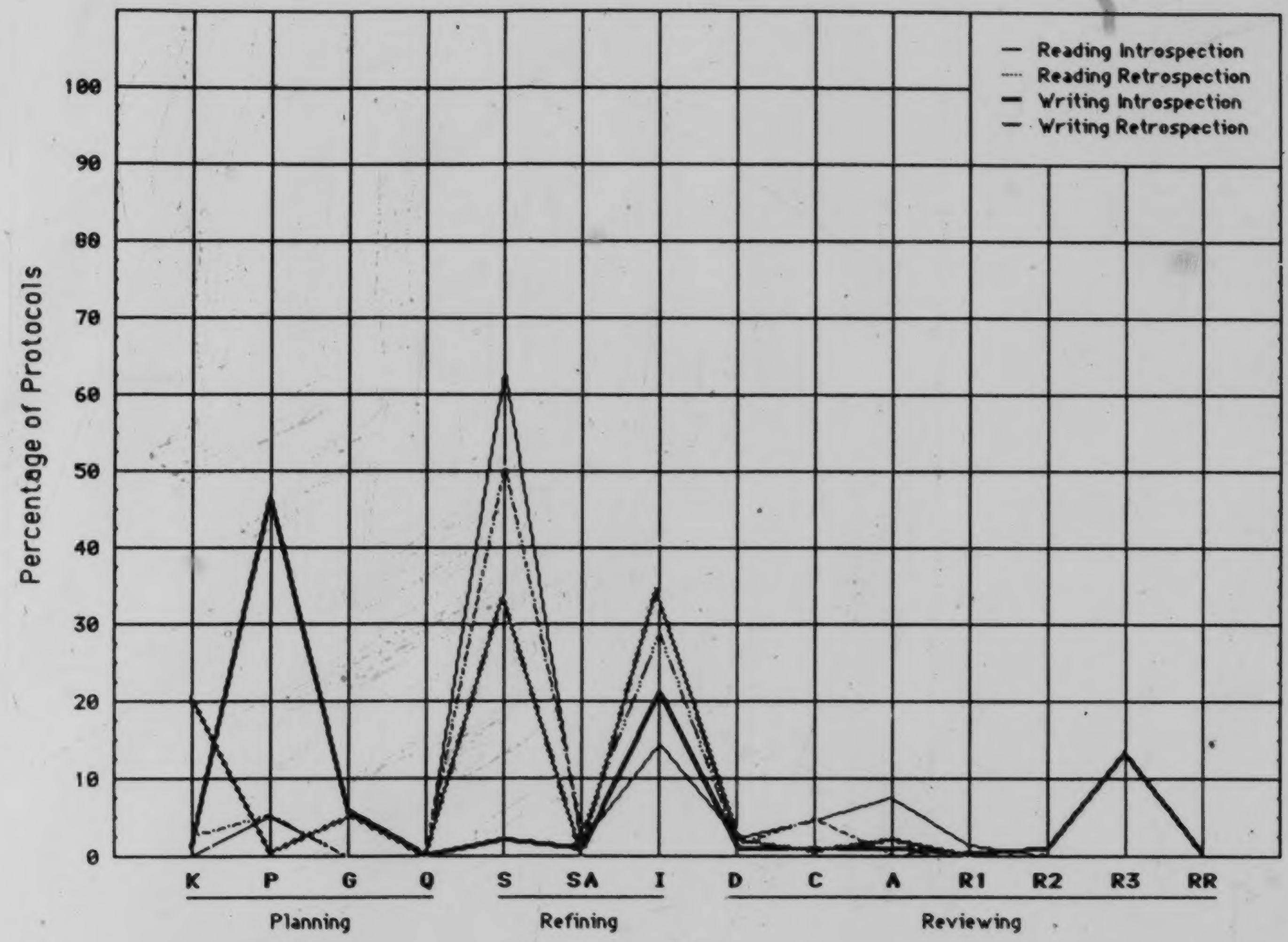

Figure 5.8 Chad: Percentages of protocols given for processes of reading and writing.

Though not unlike the group average on combined reviewing processes, Chad was set apart by his additional concern for revising his predictions during reading and revising mechanics during writing (each at 2 SD > M). In fact, he was the only subject to revise a prediction while reading introspectively, and he did so only once. Like most of the other subjects, Chad allowed himself a greater affective response to the ghost story while he was reading it than he did afterward; this was greater than his response to his own story as well.

Chad was interpretive in both reading and writing. Differences between his processing in the two included more affective responses and more conclusions drawn during reading, while greater generation of predictions occurred during writing than for reading. While it may be that he set few goals for reading, he was quite goal-oriented during writing.

Processing Style

Chad wrote the saga of a boy and his race horse in the writing session. He spent 24 minutes on the story. Chad generated almost the entire plot before beginning to write. During the writing, he paused often to correct mechanics, or to generate the specific details of each episode. However, the actual writing tended to reflect generalities and exclude the specifics. He made periodic references to his goals, and also interpreted his predictions. There was a sense of struggle in an attempt to make the plot plausible. His retrospection was a free association as he provided details of his knowledge sources and further interpreted his writing to the researcher, perhaps to justify a weak plot.

Chad began reading the ghost story by making and confirming predictions. His think-alouds, aside from selecting language units with which to associate meaning, were predominantly inferential and affective. Though he referred very little to any affective response, his interpretive, predictive and confirmatory pattern was echoed on retrospection. Even his several references to antecedent language units was done to compare information that would yield an inference. For instance, speaking of the main character in the ghost story, he said:

> And then he started a fire and warmed himslef, so that probably helped a bit because it said that it was dark and musty--pitch dark. So probably started to look a bit spooky when he got in there, but a little less as he lit the fire.

Finally, the story reminded him of a classmate whose authorship of humorous stories he admired.

In summary, the greatest similarity between reading and writing that was consistent across the four protocol types was inferencing. Questioning was never used as a strategy, but dissonance was expressed in every protocol as were confirmation and disconfirmation. References to antecedent information in order to make inferences were sometimes made in both reading and writing, while references to background knowledge were rare except after writing.

Gary

Quantitative Analysis

The general pattern for Gary (see Table 5.10) in both reading and writing involved predicting, inferencing, selecting language units, revising predictions, and disconfirming. He was below the group means for reporting his knowledge sources in both retrospective protocols, for inferencing during or after reading, and for responding affectively while reading. In the reading session, the greater portion of his protocols associated meaning with selected language units. He revealed a greater variety of processes on retrospection including 18% more predicting (1 SD > M) as well as some revisions of ideas (2 SD > M), confirming and disconfirming (1 SD > M).

In the writing session, he likewise expended much effort selecting language units and making predictions. Again, after writing, Gary reported a greater variety of processes including knowledge mobilization (1 SD > M), goal-directing (1 SD > M), and break downs in meaning-making.

His graph in Figure 5.9 is quite similar to the overall group's. On the combined processes of planning, Gary cannot be said to be very different from the group average. He was

Table 5.10

Gary: Percentage of Protocols per Process

Process	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Using Knowledge	0.0	0.0*	0.0	5.7*
Predicting	3.1	21.9*	17.7	11.3
Goal-directing	0.0	0.0	1.6*	24.5*
Questioning	0.0	0.0	0.0	0.0
Selecting	92.2*	56.2*	64.5*	32.1
Using Antecedents	0.0	0.0	0.0	0.0
Inferencing	4.7*	4.7*	6.5	15.1
Dissonance	0.0	0.0	0.0	1.9
Concluding	0.0*	9.4*	0.0	5.6
Reacting Affectively	0.0*	0.0	0.0	0.0
Revising Ideas	0.0	7.8**	0.0	3.8
Revising Words	0.0	0.0	8.1	0.0
Revising Mechanics			1.6	0.0
Re-reading			0.0	0.0
_N_	64	64	62	53

Note. Intro. = introspective data.
Retro. = retrospective data.
*1 _SD_ above or below _M_. **2 _SD_ above or below _M_.

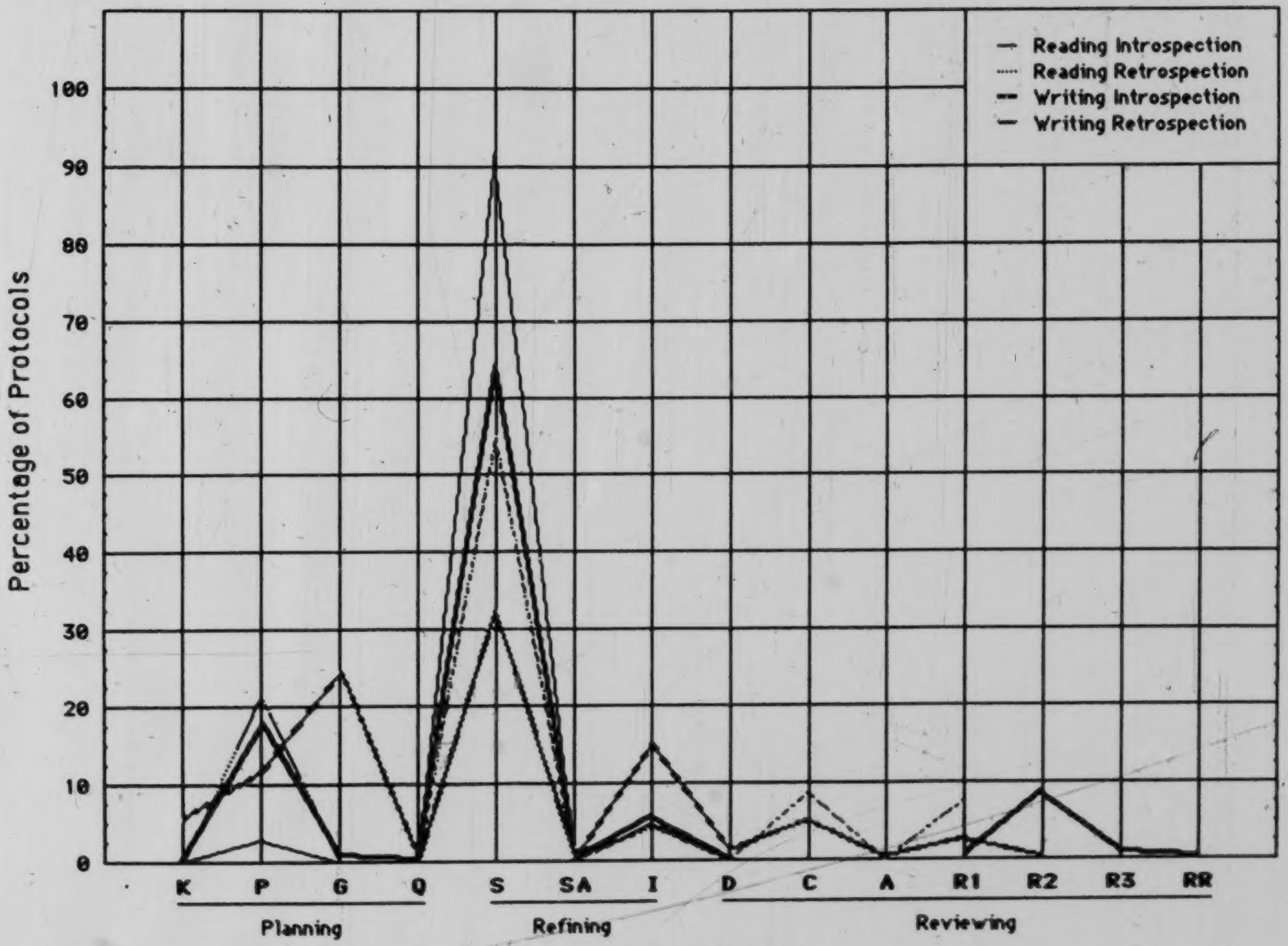

Figure 5.9 Gary : Percentages of protocols given for processes of reading and writing.

markedly above the group means for refining processes on both introspective protocols as he made nearly twice as many language unit selections compared to the group mean. He demonstrated no reviewing processes while reading introspectively, but was consistent with the group average for reviewing in his other protocols.

Processing Style

Gary produced a one and one half page hot air ballooning-survival story in 22 minutes. The ideas came to him as he wrote. In the beginning, he did some planning in chunks, then thought aloud and wrote in smaller units. While writing, he did some predicting and interpreting, but most of his think-alouds reflected selection and revision of language units. After writing, he indicated his goals as well as inferences he had attempted to set up for the reader. He also suggested some dissonance when he had created several survival tricks, then "couldn't think of anything else."

After writing the practice story, Gary claimed that changes he had made were done to make the ideas more interesting. This tended to be confirmed through his writing protocols on the target story. His introspection during writing reflected revisions of word choice and mechanics, but after writing, he did explain how he had revised ideas to better meet his goals. Disconfirming always accompanied his revision of ideas.

While reading, like writing, he predicted at the beginning, but thereafter selected language units with which to associate meaning. Again on retrospection, he indicated more predicting based on the language units selected, often followed by confirmation or disconfirmation and perhaps by a revision of ideas. That is, he followed a hypothesis-testing model throughout. Qualitatively then, Gary's processing for reading and writing was highly similar.

Stuart

Quantitative Analysis

Table 5.11 and Figure 5.10 highlight a style that distinguished Stuart from the group. While he did a high degree of planning, Stuart used a smaller percentage of refining processes compared to the group means for both reading introspection and retrospection and for retrospection after writing (2 SD > M). His time spent on reviewing processes varied qualitatively but not quantitatively from that of other subjects.

Stuart did much more questioning (2 SD > M) after both reading and writing than did any other subject, but no inferencing (below the group mean). Furthermore, his questioning equaled or exceeded his selection of language units, except during the introspective writing session, the only session where Stuart did not exceed the group mean for combined planning processes.

Table 5.11

Stuart: Percentage of Protocols per Process

Process	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Using Knowledge	0.0	14.3*	1.9	11.1
Predicting	10.0*	0.0*	3.7*	11.1
Goal-directing	0.0	0.0	11.3	16.7
Questioning	46.7*	42.9**	1.9	55.5**
Selecting	23.3	35.7	56.6*	0.0**
Using Antecedents	0.0	0.0	0.0	0.0
Inferencing	10.0	0.0*	0.0	0.0*
Dissonance	0.0	0.0	3.8**	5.6*
Concluding	10.0*	7.1	0.0	0.0
Reacting Affectively	0.0*	0.0	0.0	0.0
Revising Ideas	0.0	0.0	0.0	0.0
Revising Words	0.0	0.0	3.8	0.0
Revising Mechanics			0.0	0.0
Re-reading			17.0*	0.0
_N_	30	14	53	18

Note. Intro. = introspective data.
Retro. = retrospective data.
*1 _SD_ above or below _M_. **2 _SD_ above or below _M_.

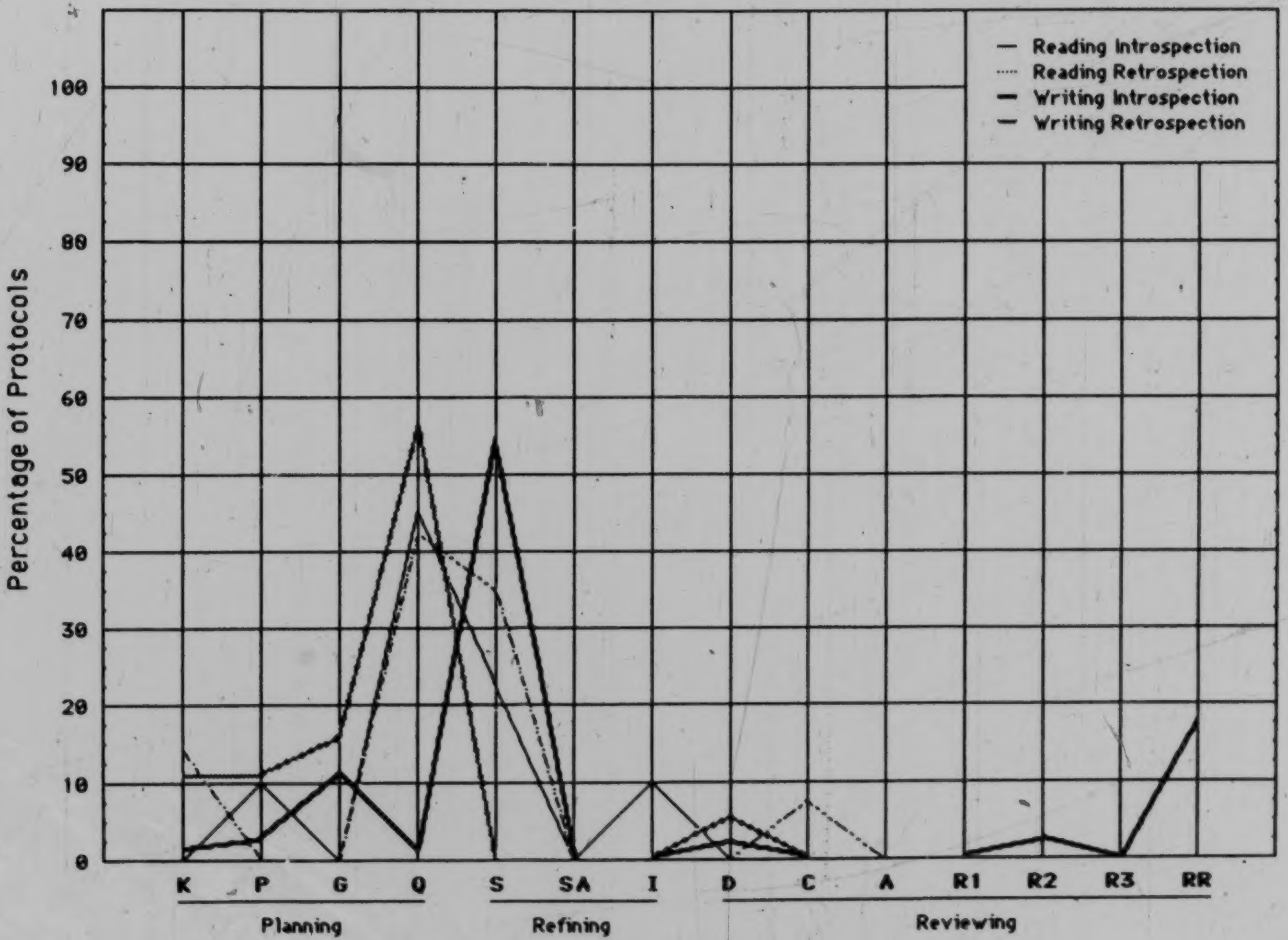

Figure 5.10 Stuart: Percentages of protocols given for processes of reading and writing.

During his reading introspection, he did do some inferencing and selecting units for meaning association. In addition, he was above group means on each of questioning, predicting, and confirming and disconfirming. His retrospection was above the group mean on knowledge mobilization, and he also reported disconfirming, but no predicting. While writing, he focussed on goal-directing, selecting language units, expressing difficulties in meaning-making (2 SD > M), revising word choices and re-reading (2 SD > M). The retrospection differed in that he discussed even more of his knowledge sources, his goals, his predictions, and his difficulties. As well, rather than referring to his selections of language units alone, he indicated a questioning strategy as he did while reading.

In addition to questioning, Stuart's retrospective report of his writing processes resembled his pattern of reading processes, especially on knowledge mobilization, prediction, selection of language units, inferencing, revision of ideas, and affective response, the latter three being unrepresented in any reading or writing protocol.

Processing Style

For the one-page mountain climbing story which Stuart produced in 30 minutes, he had a general goal in mind at the beginning (a mountain climber gets into trouble and is rescued), but then "thought things up" as he wrote. He tended to whisper his language unit selections and write them unit by unit. He re-read often, seemingly to facilitate idea generation. Once, he expressed difficulty with idea generation. Predicting ideas was either done silently or simultaneously with the selection of language units. On retrospection, he switched to a questioning style--a seeking of solutions to problems he encountered. Again, his goals and problems with idea generation were mentioned along with some knowledge sources.

This pattern was echoed during reading when he asked questions to seek reasons and motivations. If he found the answers, he did so silently. He did some inferencing and disconfirming which were rare or non-existent in his writing protocols. In writing, he expressed some difficulties not expressed for reading. The tendencies to report knowledge sources after completing an reading or writing activity, to predict (up to 11% of protocols), and to use a questioning strategy (45 - 55% of protocols), linked Stuart's reading and writing processes.

Summary

While the study participants demonstrated a degree of homogeniety in their processing, each subject proved to have his or her individual approach to the reading and writing activities. For most, a resemblance between reading and writing was evident on several aspects of their processing.

Kim's and Kate's reading and writing processes appeared to be the most dissimilar. An attempt is made here to characterize three distinct approaches, one of which each subject tended to take on both activities.

An Inquiring Approach

This label seemed the most appropriate for describing the similarity between Stuart's reading and writing. He relied heavily on a questioning strategy in the retrospective sessions for both. However, this label is assigned to him tentatively, for there were indications (see Chapter 4, and interview responses below) that he was uncomfortable thinking aloud in the writing situation. Perhaps his writing protocols might have reflected some of the predictive/confirmatory style of his reading protocols if obtained under more valid circumstances for him. Nevertheless, his quest for information and reasons can be argued to provide a definite connection between reading and writing for him that was quite distinct from the other subjects.

An Interpretive Approach

An interpretive approach would involve inferring. It would be expected that references to antecedent information and/or background knowledge would be important for making these inferences. The reading and writing processes for Chad, Sue and Kim tended to be connected through a good deal of inferencing. Sue was particularly concerned for consistency between ideas in both her introspective protocols. Retrospectively, she discussed her background knowledge in 8 to 12% of her protocols. Chad, too, referred to antecedent information on all but the writing retrospection (where none of the subjects referred to previous language units), but where 20% of his think-alouds explained his knowledge sources. After reading, he noticeably used antecedent information to make inferences.

Kim's approach was described as interpretive only because inferencing provided the strongest link between her reading and writing processes. However, for no protocol was her percentage of processes more than one standard deviation above the group mean. Indeed, her reading style might more appropriately be described as inquiring, and her writing as predictive.

It is interesting to note that Chad and Sue both wrote stories that delivered morals and were more like character studies than adventure stories. Kim's story was a combination adventure story/character study.

A Predictive Approach

The "predictive" label was intended to denote predicting based on writing goals or language units selected during reading, accompanied by confirming or disconfirming and possibly by revisions of ideas. Again, it seemed that background information would be important to predicting. Half of the subjects appeared to take this approach to both their reading and writing, namely Kate, Colleen, Steven, and Gary. Colleen and Gary clearly belonged to this group, while Kate and Steven demonstrated the characteristics of this approach less clearly. Certainly, these subjects spent more time than the others revising word choices (between 8 to 10% of their protocols). Also, all of their written stories were action adventures.

Analysis of Interview Responses

Tabling paraphrased and/or interpreted responses made by subjects to each interview question allowed a comparison between subjects as well as a comparison between reading and writing. An incapsulated profile of the group emerged which helped to interpret and to validate the results of protocol analysis.

Ideas for Written Stories

As shown in Table 5.12, one of the three titles given suggested an idea for a story to two of the subjects. Two more claimed that their story just happened, saying, "I just started" or "I was just writing along". Their ideas seemed to come to them after they had established the setting and characters. Three mentioned television, three mentioned books, and two included friends as souces of inspiration.

In discussing the sources of their ideas, subjects sometimes alluded to goals in terms of the development of their ideas throughout the story. Kim got her basic ideas from a television show, but was emphatic about changing the character's attitudes. Kate knew in the beginning that her character would dream about monsters, but the actual dream episodes emerged one at a time. Sue decided in the middle of her story how it would end, then "directed it in that direction." After thinking of the main idea for his story, Steven said the rest "just came to me like that." For these

Table 5.12

Can you tell me about the idea for your story and where it came from?

Kim	A television show.
Kate	The title suggested a monster to her.
Sue	Her setting and introduction of characters ("I just started.")
Colleen	The title reminded her of a Vancouver golf course marked off by string tied to darts to keep kids off.
Steven	Books (Mad Scientists), television and friends.
Chad	A book (Misty's Colt); a friend's horse.
Gary	"I was just writing along and I couldn't think of anything so I just made them get lost in the wilderness."
Stuart	Television and books about mountain climbing.

subjects then, overall goals existed at the start of writing with subgoals being addressed as the writing unfolded.

No parallel question for reading was apparent at the time of interviewing. However, in light of the lack of think-alouds produced about reading goals, it might have been elucidating to probe subjects about their conception or goals prior to reading the ghost story, and how these unfolded as they read.

How Does the Story Make You Feel?
What Does it Mean to You?

A summary of responses to these questions is presented in Table 5.13. While all subjects answered the questions for reading, three felt they had nothing to say about their writing in this regard. Asked together, the questions elicited two basic types of answers: an identification with or interpretation of a character's feelings, or a theme statement. Kim and Sue gave the former for reading. Kate expressed a desire to actually participate by seeing the castle and meeting the ghost. Kate, Sue, Chad and Gary empathized with characters' feelings in the stories they wrote themselves. Three subjects mentioned the plot or theme of the ghost story: Colleen was bored with a plot she had read before, Steven gave a statement of the main plot, and Chad extrapolated a moral for living. None mentioned the plot or theme of their own stories.

Table 5.13

How does the story make you feel?
What does it mean to you?

	Reading	Writing
Kim	Happy the tinker got a reward. Happy the ghost got helped.	N/A
Kate	Would like to see the castle, meet the ghost.	The boy might have some home problems. He has an imagination.
Sue	Scared, then happy for the tinker.	Sorry, scared for girls, but found it a funny situation.
Colleen	Bored with same story.	It might come true.
Steven	A brave person banished a ghost.	N/A
Chad	"Maybe you'd stop having troubles if you just tried to fix it."	Happy at star's birth; sad for injuries; happy about the riches.
Gary	It sounded like it was in the olden days.	Sorry people got lost; happy they were found.
Stuart	Curious why you don't see or hear any ghosts yourself.	N/A

In variance with these types of answers, Colleen suggested that her story could have some application to her life--that it could be prophetic "like in the Bible". Similarly, the ghost story led Stuart to wonder why one doesn't hear or see ghosts oneself. Gary's response for reading was unique in that the setting made him feel like he was "in the olden days".

Comparing responses for reading and writing, only Kate and Sue addressed similar aspects for both when answering this set of questions.

Important Information

Because students are often asked comprehension questions requiring that they give evidence from the text or develop a main idea statement, it seemed appropriate to find out what information they considered important to the story they read and important to have included in their own stories for other readers. Since the answers were generally long and specific, their comments were summarized and classified in Table 5.14 according to elements of story structure.

Six subjects included the setting (a deserted castle or lifeless adventurers found in front of the fireplace) as important to the story. Colleen explained that it shows "what the tinker was daring to do"; that is, it was a reflection on his character. All but two mentioned the tinker's character and/or his calm reaction to the ghost. A few key elements of plot were mentioned by most subjects. The outcome was important to all subjects whether it was because the ghost was helped, the ghost was banished, or the tinker got his reward and returned to tell his story.

Table 5.14

What information in the story was important to you?

	Reading	Writing
Kim	Description of castle; tinker's character; ghost's situation; outcome.	Contrasts (expectations and reality; character's feelings of happiness, worry).
Kate	Plot (tinker's decision, ghost falling, tinker sets body aside, ghost vanishes).	Happy ending.
Sue	Description of castle; tinker's reaction to ghost; end is consistent with beginning.	Theme (You should be cautious); contrasts (change in character's dialogue).
Colleen	Description of castle/ venturers to reflect tinker's character; tinker's occupation; warnings; descriptive detail; ending (poor).	Details, inferences set up; trophy as motive; supernatural (author belief in ghosts).
Steven	Description of castle; tinker's character/decision; plot (tinker not frightened, ghost disappears, tinker to get reward, tell story).	Episodes; causes of problem (updraft, clouds, mountains lose time in the race).
Chad	Setting (lifeless venturers); motive (reward); humor; plot (ghost re-assembled, vanishes, tinker gets reward.	Theme: Being mentally handicapped or paralyzed, you can still do something.
Gary	Characters; plot (tinker investigates, hears voices, is calm, body falls, tinker helps ghost, gets reward) contrast (tinker vs. others).	Cause of problem (wind); Resolution (Steve's dad finds them).
Stuart	Setting (lifeless venturers, ghost moaning); problem (ghost falling); character (ghost's appreciation).	Prior knowledge (mountain climbing equipment, cliffs).

Sue and Colleen stated opposite opinions about the ending, Sue finding it consistent with the beginning of the story and Colleen finding it unsatisfactory. Colleen also thought the descriptive details were important, and Chad mentioned elements of humor and the tinker's motive for entering the castle.

In general, subjects were less forthcoming with important information from their own stories, and the information they indicated was quite unlike that given for the ghost story. However, some of their comments here might also be considered more thoughtful or analytical than those given for reading. Kim noticed contrasts between her characters' feelings and between reality and expectations. Sue and Chad both gave theme statements for their stories (though they did not do this when asked for the meaning of their story). Colleen discussed the inferences which her details set up for the reader, the trophy as a motive, and the supernatural element in her story. Steven discussed the three main episodes of his story in terms of their contribution to the problem. Stuart may have misinterpreted the question when he gave the prior knowledge he needed in order to write a convincing story.

Surprises and Discoveries

The predominant surprises for subjects yielded by the ghost story were, as summarized in Table 5.15, the idea of the ghost falling in pieces down the chimney and the tinker's nonchalance at staying in the castle. Seemingly, discovery was precipitated by a violation of subjects' existing schema for "ghost" and for "reaction of someone who meets a ghost". Kate's concept of a ghost as being white and walking through walls was also violated. Colleen, too, was surprised that a ghost would disappear by removing its clothes. Also, she expected the main character to be a knight or a cook. Gary noticed that even though the ghost fell onto the hearth, nothing got burned, thus violating the internal consistency of the story for him.

Rather than alter existing schemas as they did while reading, subjects seemed to make new connections between schema while writing. Kim discovered she could apply what she knew about the dream technique to make her entire story a dream at the end. Sue discovered that the original concept for her story plot had to be altered because of the characters she created; Chad's initial plot changed as well. Details were again Colleen's focus: she discovered noises that had to be described differently than she expected, and how her character would have to think in order to act consistently with her goals for the story. Gary discovered

Table 5.15

Did anything surprise you or feel like a discovery as you were reading/writing?

Reading	Writing
Kim	
Ghost falling in pieces down chimney; tinker's courage.	At the end, made the whole story a dream.
Kate	
Ghost falling down chimney (not going through walls); ghost with clothes (usually a white sheet).	No.
Sue	
That the tinker stayed.	Was going to have both girls in the balloon, but didn't suit one character.
Colleen	
Disappearance of ghost after removal of clothes; didn't find out about lifeless bodies or ghost's story; main character sells pots and pans (wasn't a knight or cook).	The noises she described (swish/crack of golf ball, screaming after nightmare); character pushed the dream from his mind.
Steven	
Ghost falling in pieces down chimney; tinker's lack of fear.	Effect of the updraft.
Chad	
Ghost falling in pieces down chimney (instead of whole ghost down staircase); tinker's lack of fear.	Plot turned out much different from initial prediction (not running free on an island).
Gary	
Tinker's calmness; body fell on hearth but nothing was burned.	Torch used to make fire; cloth used for a bed.
Stuart	
Ghost falling in pieces down chimney; tinker's bravery.	No (wrote about things he already knew).

some creative improvisations for survival that worked in the situation he had set up. Steven's schema for an updraft seemed to have been altered, though perhaps not accurately or confidently. Only two subjects claimed that nothing surprised them in their writing.

Expectations and Preferences

In some ways the surprises to subjects and discoveries they made were related to their expectations about the stories they read and wrote (see Table 5.16). Colleen maintained that she would have liked the ending to answer her questions about the story. Similarly, Chad would have preferred a more imaginative ending rather than a common happy ending. While most did not expect the tinker to be so brave or the body parts to fall down the chimney, they generally expected and wanted the tinker to get his reward and the ghost to disappear. Kate commented that, "if stories always worked out how you want them to, then they wouldn't be interesting." Except for Chad and Gary, who initially expected different plots, the subjects were good predictors of the general ending of their own stories with the details being worked out as they wrote.

Table 5.16

Did the story work out the way you expected or wanted it to?

	Reading	Writing
Kim	Yes, tinker got reward; ghost got help. But expected tinker to run away.	Yes, Collette was rescued; mother was happy.
Kate	No, expected tinker to run away, then return and die. "I like it this way."	Yes, knew dreams would end; hadn't thought of doctor at beginning.
Sue	Yes, glad the tinker didn't get murdered.	Yes, expected character to escape the hot air balloon.
Colleen	No, the story ended before answering many questions.	No, didn't expect character to disappear, but wanted it that way.
Steven	Yes, tinker got reward; ghost disappears.	Yes, race was lost due to episodes.
Chad	Yes, tinker got reward; ghost disappeared, but expected a fight or chase. Wanted a different ending.	No, initially expected to write a different horse story.
Gary	No, expected a guy in a sheet.	No, didn't expect a lost and found story, but did want trouble with balloon.
Stuart	No, tinker wasn't scared out; ghost fell down chimney in pieces.	Yes, climber got into trouble, then rescued. Wanted it longer, more interesting.

Solving Problems of Meaning-making

Re-reading was the most frequently mentioned strategy for dealing with problems of meaning-making (see Table 5.17). As readers, seven subjects would re-read for omitted words, to figure it out, to make it sound understandable, or for answers to questions. As writers, three would re-read. Sue reported that she read words aloud to help identify them when they "swarm in front of my eyes."

Looking big words up in a dictionary was the next most popular answer, given by three subjects for reading and one for writing. Two subjects would ask someone for help, and two would look for clues further on in the story. Colleen's answer for reading was most interesting. She claimed she would re-write the story by thinking up her own ending. Since she had done the writing session and interview before the reading session, there may have been some effect on her answer by the parallel question asked about writing. Nevertheless, it would not seem inconsistent with her profile to accept this as a valid answer in her reading interview; she was not one to constrain her meaning-making to a text.

For problems of meaning-making met in writing, five subjects besides Colleen mentioned strategies similar to those they would use for reading problems. Kim would re-read and look up big words as she would for reading, and also check for errors. Kate would re-read to detect missed

Table 5.17

What do you do when something doesn't make sense?

	Reading	Writing
Kim	Re-read; try to figure it out; look up big words.	Re-read; look up big words; check for an error; try to correct it.
Kate	Re-read for omitted words.	Change it; add words; write it all over again.
Sue	Read aloud to identify words; ask mom or dad.	Re-read; cross out; put in (often trouble with past tense).
Colleen	Re-write; think up own ending; re-read or read another of the author's books for answers to questions.	Re-write; add detail or description; add interest; eliminate confusion.
Steven	Re-read; look up words; ask someone.	Try to make it sensible; use thesaurus, ask mom.
Chad	Read story for clues to a word; use dictionary; re-read.	Re-read; erase it; think of something else (not easy).
Gary	Re-read to make it sound sensible; check for words out of place or misspelled.	"If I don't say it in my head right, I write it to make sense on paper."
Stuart	Re-read; leave it, then go back when I find out later in the story.	Correct it; think of something else.

words in her reading, and would add words as well to make her writing more sensible. Steven would use a thesaurus and ask his mother, both strategies that he included for reading. Chad would re-read in both instances as well as erase and think of something else for writing. This last strategy was mentioned by four other subjects, with Colleen specifying addition of detail, description and interest, and the elimination of confusion.

Gary's comment, "If I don't say it in my head right, I write it to make sense on paper" suggests that he knew better how he wanted to say something after he had put it down and examined it. There is a sense that he used the "sound" of literature as a gauge and strategy for achieving meaningfulness in both reading and writing.

Usual Approach to Reading/Writing

The responses given in Table 5.18 were of two kinds because of the different interpretations of the question. Some referred to the thinking aloud and the types of thinking they did. Others addressed the elements of stories that they usually focussed upon. The first was always inquired into if not volunteered (although this was overlooked in Chad's case).

All but Stuart indicated that they usually did the same type of thinking as they did in the think-alouds for the study. However, Sue, Chad, and Stuart didn't think they would stop as long or at all to think about different parts of a story. Perhaps their comments were an attempt to represent an automatic or involuntary nature of thinking while reading to maintain a flow of meaning--skills which develop with much practice. Sue said, "I wouldn't like sit there and just think about one part for a long time or anything--just goes--just think about it for a second or--and then go past it and keep reading." Similarly,

Table 5.18

Do you usually read/write stories the way you did this one?

	Reading	Writing
Kim	Yes, evaluative comments made to herself.	Yes, uses dialogue and descriptive words rather than explaining; setting; main idea.
Kate	Yes.	Yes, plan then write; does title at end, but doesn't usually use monsters or dreams.
Sue	Yes, but thinking is shorter.	Yes, plan then write.
Colleen	Yes, making judgments based on reasons.	Yes, writes down what pops into her mind; rejects ideas; attends to facts, consistency and interest.
Steven	Yes, emotional responses; predicting.	Yes, gets reader to ask, "Will they get out?"; excitement.
Chad	No, skims; reads and knows, but does predict.	Writes a variety of story types.
Gary	Yes, re-read; talks to self when it doesn't make sense.	Yes, thinks the same; uses action, excitement, adventure.
Stuart	No, thinks about story at the end of reading; asks different questions.	No, usually longer, more interesting stories about things he had experience with.

Chad commented, "Some things are pretty practical. You don't really have to think about it; you read and know." Stuart, too, claimed, "I don't stop and think about it. I just read it through and sort of think about it at the end."

Steven's response for reading seemed to exemplify the predicting paradigm concretely. He claimed he might stop at an exciting part to talk to himself or to ask his cat, "Curious, what do you think's going to happen next?" and then finish reading the next day.

Opinions of Target Stories

The subjects' responses to being asked what they thought of the story they read or wrote are paraphrased in Table 5.19. This question was asked to gain an impression of the subject's attitudes to participation in the study. However, the question proved to highlight the hesitancy and ambiguity with which subjects chose to describe their own work compared to the more assertive opinions they expressed about the ghost story.

With some qualification, five of the subjects liked the ghost story saying "pretty interesting", "good", "funny" and "I liked it". Approval of their own stories was more tempered with expressions such as "okay", "all right", "not bad", and "so-so". Four thought that given more time, they would add more detail or suspense, or make their stories longer. In rating his story, Steven expressed one reason why the group may have tended to have more affective responses to the story they read than to the ones they wrote: "It's hard to say because, you know, I wrote it and it's hard to criticize on your own work."

Table 5.19

What do you think of the story you just read/wrote?

	Reading	Writing
Kim	Kind of boring; not my type of story.	Okay, has written better. Some readers might not be interested in it.
Kate	Pretty interesting. I liked it. Good. Funny, not all serious.	All right, not that good. Not much suspense.
Sue	Good, but short. I liked it.	Not one of my best; not good. Okay; pretty good.
Colleen	Okay, if hadn't read before. Interesting, but questions unanswered. Didn't enjoy it; didn't make sense.	Pretty good. Would like more time to add to it.
Steven	Funny; weird; plot different from expected.	Not bad, could be improved with more details.
Chad	5/10. Likes longer stories. Mystery/adventure good, but ghost leaves too easily.	This is good, but space story he's writing is way better.
Gary	Pretty funny. Okay. Didn't get into detail but pretty good.	So so. Short. Tells what might happen in a balloon crash.
Stuart	I like it (interested in ghosts). Exciting to think about how the story might end.	Too few ideas/episodes. Not as long or as interesting or as fun for the reader as his best.

Two subjects attempted to judge their stories from the point of view of the reader. Kim observed, "I've wrote better, but it seemed okay to me. I don't know if people would want to read it though. . . . Lots of people aren't interested in that kind of subject." In comparing his story to the best that he had written, Stuart claimed, "It's not as fun to the reader." Neither was it as fun for him to write because he "didn't really know anything about it hardly," preferring to write about things he had experience with.

Despite their modesty about these stories, six of the eight subjects referred to a "best story" that they had written--and with pride. One mentioned having hers published in a magazine; another recounted the long story he was currently writing in class. It seems likely that their affective responses to those stories had been validated by teachers, classmates and parents.

The Makings of a Good Story

For this question, differences between reading and writing faded. What one likes to see in a story seemed to be the things one must put into it. Generally, subjects mentioned aspects of products such as good description, details, characters, dialogue, emotions, setting, suspense, choice of words, excitement, adventure, and appropriateness to age level (see Table 5.20).

Occasionally, a subject mentioned aspects of process rather than product, as when Chad said that good writing took concentration, that one should "get into the habit of writing alot", and that one should "think about it quite a bit before you start." Kate alluded to the style of the writer as influencing the quality of a story when she said, "Depends how you write. If it's a good author, then it's a good story." In the same vein, Colleen suggested putting yourself in the position of characters in order to describe their thoughts and feelings more realistically. She also suggested that some ideas for writing could come from unsuccessful predictions made while watching television programs, or while in bed.

References were made by Colleen as well to the process of reading good stories. She liked the description to be good enough to "get a good picture in your mind to focus on, so you can get the story," and characters that are realistic, "because sometimes when I read stories about normal kids that act like one of my friends, I can focus on my friend, you know, and imagine her really doing all this." Discussing the setting, she took a writer's point of view to suggest that the author describe "sights that you know of." Stuart, too, alluded to reading processes when he observed that a story "has to get the reader involved."

Table 5.20

What makes a story good to read?
What goes into writing a good story?

Reading	Writing
Kim	
Descriptive words; distinctive characters; dialogue; good details; mixture of emotions; not too much description of setting before introducing characters.	Descriptive words; dialogue instead of explaining; distinctive characters.
Kate	
Suspense; surprise ending; funny parts; descriptive words; "How you write."	Suspense; descriptive words; good start; characters' feelings.
Sue	
Good description of setting and what's happening, then more dialogue.	Appropriate to age level; realistic or fantasy; interesting details, but not too many.
Colleen	
Good description; good choice of words; appropriate to grade level; believable characters to identify with or recognize; setting familiar to author.	Assume character's role; good title and beginning; thinking of ideas at bed time or by predicting from television programs.
Steven	
Details, depending on type of writing.	Good imagination (for fiction); good writing skills; details.
Chad	
Interest; appropriate for grade level; humor; adventure; main character trying to get away with something.	Write alot (habit); mixture of emotions; imagination ("be a good thinker"); concentration; good ideas; much pre-thinking.

(table continues)

Reading	Writing
Gary	
Good plot, characters; humor; adventure, if drama; excitement, if scary.	Humor; excitement; drama; action; frightening parts.
Stuart	
Interesting topic; clear, not confusing; excitement (gets reader involved).	Lots of episodes; interest; fun; good sentences (not choppy, easy to understand, make sense); get reader involved.

Comparing Thinking for Reading and Writing

Given the reliance of this study on self-report, it seemed appropriate at the end of the study to ask the subjects directly about the similarities and differences between the thinking they usually did for reading and the thinking they did for writing.

As can be seen in the summaries of Table 5.21, Colleen misinterpreted the question, telling instead how reading and re-reading influenced her writing. But the remaining subjects each had an opinion. Two, Gary and Stuart, thought that their thinking was the same for reading as it was for writing because for both one predicts what will happen farther into the story. Stuart added, though, that when writing, you have to think about "how you're going to spell a word, how you're going to say something--write it down on paper," that is, the mechanics of producing a written story.

Kate and Steven felt that they had to predict what would happen next in writing, or as Steven put it, "I have to find out what I'm going to write." Neither of them thought that they had to use the same process for reading because, as Kate said, "you don't really have to create anything." Steven examines this idea more specifically:

Table 5.21

Compare the thinking you usually do in reading to the thinking you do in writing.

Kim

Own ideas for writing vs. someone else's in reading; ie. writing takes more thinking and decisions.

Kate

Use clues to guess in reading; put clues in to lead to killer in writing. Have to think what's going to happen next in writing; not creating in reading. Can use what you like to do more in your own stories.

Sue

Think about the dialogue and descriptions for both. In writing, you know what's going to happen (usually), but in reading you try to find out.

Colleen

Takes notes on interesting paragraphs to use in her own writing. Re-reads often to see if her writing should be changed or if new ideas come to her.

Steven

Have to think more to write than to read. Talks out loud to write (thinks better). Reading isn't hard so can think in his head, except on difficult words.

Chad

Thinks/works more to write than to read. More confident with reading since he reads more. Re-reads when writing to figure out what to write next.

Gary

Predicts what will happen farther into the story for both.

Stuart

Predicts what will happen farther into the story for both. Writing demands attention to word choice and mechanics.

"When I write, I sort of talk to myself out loud, not just in my head because I can think better when I'm talking out loud. But when I'm reading, I can just think in my head because it's not hard to read--unless I come to this word that I can't understand."

Kim and Chad might agree as they both claimed that they had to think more and make more decisions in writing than in reading. Kim's explanation was: "I'm writing a story and I have to put down my own ideas, and when I'm reading, I'm reading somebody else's ideas."

Sue had the opposite point of view. She said, as a writer:

> . . . you know what's going to happen--well, usually--because you're writing it. . . . So you can't really think, 'I wonder what's going to happen,' because that's what you do when--like if you're reading a story and something weird happens, you're thinking, 'I have to keep reading because I have to know what's going to happen.'

There is a degree of validity in all three points of view. Both reading and writing do seem to involve predicting what will happen. However, this skill may have become so automatic in reading for some learners with a rich background knowledge, that they do not consider it as being "hard". Chad claimed, "I'm more confident with reading because I usually read more than I write." Writing, on the other hand, does involve an additional set of skills for mechanically producing text. Still, one cannot reject Sue's observation that wanting to know what will happen next is often a motive for continuing reading, while we usually have an idea where our own writing will lead us. Perhaps she referred to general goals such as those which most of the subjects began their writing with, while Kim, Kate, Steven and Chad referred more to the difficulty of meeting subgoals.

Interpretation of Interview Responses

An examination of the responses given by subjects to interview questions does suggest some specific relationships as well as contrasts between the processes of reading and writing. Aspects that were illuminated included global goals and subgoals, discovery experiences, problem-solving strategies, process duration (the effects of experience), affective responses, and the elements of a good story.

Different levels of goals in writing emerged especially from the responses to the first and the last questions. In response to the first, subjects described how their story ideas changed and developed as they wrote. In response to the last, some indicated that they knew, perhaps in a global sense, what would happen in stories they wrote themselves. Still others felt, perhaps in the sense of subgoals, that they had to "find out" what they would write by writing.

Meeting these subgoals appeared to be a challenge that separated writing from reading. Indications about both reading and writing goals were apparent in subjects' selections of important information from the stories, and in the meaning of the stories to them. For reading, details of setting and character development, problem and outcome were cited as being important information, especially where inferences were provided and the internal consistency of the story maintained. For writing, on the other hand, more global aspects of the story tended to be discussed, though briefly.

The reverse was true when the subjects were asked about the personal meaning of the stories. For reading, half of the subjects at least mentioned a global aspect of the story, but for writing, subjects tended to lose sight of global goals to focus on subgoals of details such as characters' feelings, or gave no response at all.

Two influences on subjects' responses about goals might be suggested: a) the automaticity of reading processes compared to the slower processes of writing, and b) cultural norms for assigning value to one's own work.

Reading was apparently more automatic than writing for these subjects. Several mentioned that they wouldn't usually stop to think as long or at all about each part of a story, as they did for the introspective reading sessions. None indicated this for writing. As well, in their own comparisons of reading and writing, they often commented on the relative ease of reading. Perhaps, then it is easier to keep a sense of the global goals of plot and theme in mind while reading than while writing when subgoals demand attention.

In giving their opinions of the stories they read and wrote, the subjects may have been modest or unsure about their own stories as they gave fewer and more cautious affective responses for their own stories than they did for the ghost story. Perhaps they were influenced by social norms which would dictate modesty. Certainly, they seemed aware that it is easier to make objective judgments about someone else's story than about one's own. A reader is free to form his or her own opinion, while a writer must distance the self in an attempt to perceive the piece as most readers would, for the writer strives to appeal to the widest audience possible.

Three areas suggested similarities between the reading and writing processes. First, both reading and writing precipitated surprises and discoveries either by violating expectations based on existing schema (usually in reading), or by making unexpected connections between schemas (especially as the goals or subgoals in writing changed). Generally, the subjects were good predictors of story outcomes both as readers and as writers.

Second, subjects mentioned using some of the same strategies for dealing with problems of meaning-making in reading and writing. The more common strategies included re-reading, using a dictionary or thesaurus, asking for help, and detecting omitted words.

Finally, little difference was found between reading and writing for ideas about what makes a good story. As expected, responses focussed on an end product, such as use of description, dialogue or details, rather than on the processes used. The few references to processes that were made, served to emphasize that the reader is in a measure responsible for making a story good to read.

Influences of Instruction on Subjects' Processing

Mrs. Scott's and Mr. Field's teaching paradigms for reading did not appear to be substantially different. If usually followed the paradigm that they used in the observed lessons, it would seem reasonable to expect their students to place some emphasis on relating their background knowledge to a story, on asking questions, making inferences and predictions, and on responding affectively.

Of the five subjects from Mrs. Scott's class (Kim, Sue, Steven, Chad and Gary), all discussed some of their background knowledge for the stories (Kim and Steven were above the group mean on this variable). Only Kim put emphasis on questioning during reading, and Steven did some questioning during writing. Predicting and goal-directing were important aspects of planning in writing, especially for Gary and Sue. Inferencing was emphasized for both reading and writing, though less so by Gary and Steven than by Sue and Chad. Affective responses were high for Kim in reading and for Sue in writing, and present for all but Gary.

Given the small number of subjects and the variability in patterns, it is not possible to draw conclusions about the extent to which the classroom environment influenced the processing of these five individuals. It may be that Kim and Sue reflect their teacher's paradigm more than the others because it is consistent with their own reading and writing styles.

Three of Mr. Field's students served as subjects in this study: Kate, Colleen and Stuart. Colleen and Stuart both referred to their background knowledge a great deal either during or after reading. Kate exceeded the group means on most measures of predicting, and Colleen did so when discussing her writing retrospectively. Stuart was more inclined to use questioning than any other process, except while talking introspectively about his writing, and 10% of Kate's retrospective protocol after reading were questions. Stuart used little or no inferencing while Kate and Colleen resembled the group average in this regard. Colleen responded affectively to her own writing more than any other member of the group, but she and Kate resembled the group in affective responses to reading. Stuart indicated no affective response.

While Mr. Field's writing program followed the Graves (1983) conference model, Mrs. Scott's followed a more traditional structure. Yet, both seemed to address similar processing concerns. Possibly the conference approach made children more aware of details, word choice and writing styles, and may have encouraged longer stories. Both Colleen and Stuart preferred to write longer stories than they did for the study. Colleen commented during the observation that her current writing project was 13 pages long and was not finished yet.

The terminology used by Mrs. Scott in the observed lesson did, however, seem to be echoed in her students' responses to some interview quetions. The three subjects who mentioned using a dictionary or thesaurus as a problem-solving strategy in reading were members of Mrs. Scott's class. Two also mentioned this as a strategy in writing. The terms "describing words", "dialogue", "detail", and "different characters", as well as references to suitability of the story to readers' grade level, were used by subjects when telling their opinions of the stories they read and wrote, and when explaining what makes a good story. Perhaps most interesting is the fact that they used these terms in both the reading and writing interviews.

It is difficult to estimate the influence of terminology used to talk about writing during the weekly conferences in Mr. Field's program. The terms used by students in this class to talk about their writing cannot be considered to differ greatly from that used by subjects' from Mrs. Scott's class. Some of the terminology of the analytic scale used by Mr. Field to evaluate writing was echoed in the interview responses given by subjects from his class. In particular, Colleen emphasized the importance of "details" and not "confusing" the reader. Stuart would also avoid confusing the reader as well as "short, choppy" sentences.

Summary

The protocol analysis provided evidence of individual processing styles that were applied to both reading and writing by at least six of the eight subjects. Three different processing styles emerged from the data: an inquiring approach, an interpretive approach, and a predictive approach. The responses to interviews helped to verify and explain the results of protocol analysis. Processes that differentiated reading from writing included goal-directing (more often used while writing) and responding affectively (more often done while reading). As well, the subjects suggested that reading was a more automatic process for them than was writing. Similarities between reading and writing were apparent in that both activities could lead to discoveries, though schema changes might have occurred in different ways. Subjects indicated that they would use similar strategies to deal with problems of meaning-making in reading and writing. Considering contextual data, there would appear to be a relationship between the emphasis of subject's Language Arts program and their processing.

CHAPTER 6

CONCLUSIONS AND IMPLICATIONS

Summary

The present study was intended to provide support for Tierney's (1983) model paralleling the reading and writing processes, and thus perhaps lend support to the integrative and process oriented approaches of teaching Language Arts. In so doing, specific processes and processing styles used by good grade 6 readers and writers were described.

Eight sixth-graders, each judged to be a good reader and writer, were asked to think aloud during and after reading a ghost story and writing their own stories. Parallel instructions were designed in order that data collected from the reading and writing sessions could be compared. Protocols were coded using categories of processes defined through:

a) a review of coding systems used by other researchers;
b) sampling protocols obtained in the think-aloud sessions; and
c) relating processes to the global processes of Planning, Refining, and Reviewing in Tierney's model.

The percentage of each subject's protocols obtained for each process in the introspective and retrospective sessions was compared to the group means and standard deviations calculated for each process. The processing style of each subject was described quantitatively and then qualitatively by referring to the coded sequences of processes. Retrospective and introspective data were also collapsed to provide an impression of the group's trends in the relationship between reading and writing processes. Finally in the protocol analysis, similarities between subjects in their approaches to both the reading and writing activities were described, with three approaches emerging.

In addition to obtaining protocols, contextual and verification data were collected. Interviews were conducted with subjects about their processing, but also about their interests and lifestyles. Teachers were interviewed to obtain an indication of the extent to which each subject's participation in the study had been typical of his or her usual performance in class. Cumulative files provided factual and background information about the subjects. Personal journals provided insight into their personalities, backgrounds, and motivations. Together, the data permitted the development of subject profiles that further illuminated and validated their processing in the study. To describe the context of subjects' learning, both participating grade 6 teachers provided information about their Language Arts programs and allowed an observation of a lesson as a concrete referent.

Findings and Conclusions

Here, an attempt is made to use the findings from the protocol analysis and interviews to answer the research questions posed in Chapter 1. Given the small sample size of the study, the answers cannot be given conclusively, but are offered instead as indications that warrant further investigation. In some instances, though, the findings help to confirm the results of previous research.

Question 1

> What processes have good readers/writers in this study developed by grade six
> a) for reading?
> b) for writing?

Seventy-five percent of the sixth-grade subjects' reading protocols fell into four categories of processes: questioning, selecting language units, inferencing, and responding affectively. Selecting language units received 38% of their attention. Knowledge mobilization and predicting were also important to reading at 7% and 8%, respectively. On the global processes of Tierney's model, 25% of the time was spent planning their meaning-making, 58% was spent refining a model of meaning, and 17% was spent reviewing.

For writing, 75% of protocols were coded as one of these four categories: predicting, goal-directing, selecting language units (again having the highest percentage at 32%), and inferencing. Knowledge mobilization again received 7% of attention. On the global processes, 41% of the time was spent by subjects on planning their story and writing procedures, 45% was spent refining a model of meaning, and 14% was spent on reviewing processes.

Most of the planning and refining processes, then, would appear to be well-developed in good readers and writers by grade six. The subjects were good at identifying their knowledge sources on retrospection. They were good at selecting language units to prove the meaning-making that was evolving for them. They rarely expressed confusion. They were generally in control of text.

It might be tempting to suggest that processes which were rarely represented in protocols were not well developed or developed to a conscious level in these subjects (goal-directing in reading, comparing textual information to test consistency or to make sophisticated inferences, and the reviewing processes of drawing conclusions and making revisions). While this may be so, it is just as likely that these processes were available to these good readers and writers, and that they were called into play under specific circumstances. Hence, though represented by very small percentages, the fact that they were represented at all could be significant. On the other hand, some of these little-used processes seemed to be important to some subjects' processing style while others did not use them at all. For example, Colleen skewed the percentages upward for drawing conclusions and revising ideas in her writing and reading.

Some of these processes may be so automatic that good readers and writers need give little conscious attention to them (for instance, revising their ideas after predicting). The absence of goal-directing statements for reading might be due to some existing implicit global goals that rarely vary for grade 6 readers (eg. enjoyment or to get good grades). Given the great deal of experience these subjects had with reading, it is possible that goal-directing at a subgoal level was an involuntary process. Several subjects expressed impatience with having to stop to think aloud while reading, and may therefore have omitted to say things they felt were less important. Confirming and disconfirming may also have been an automatic process regarded as slowing down meaning-making and thus not verbalized often.

The amount of predicting done, especially while writing, compared to the small amount of revising suggests that subjects were either good predictors or lacked revision skills. Since only 4% of their writing protocols involved revising word choices, it may be that their verbal facility allowed these children to say what they meant with little revision needed.

Mechanics of writing were likewise not often revised though errors were made. It is probable that subjects' proofreading skills were still developing, that they would have revised more given circumstances in the study that encouraged them to do so, and that these subjects were more idea-oriented than product-oriented.

Question 2

> Are certain cognitive processes more likely than others to be common to both reading and writing in sixth grade subjects? If so, what are these processes?

Processes used most frequently by both readers and writers and in similar proportions included mobilizing knowledge (7%), selecting language units with which to associate meaning (32-38%), and inferencing (13-18%). The findings confirm that both good readers and writers make predictions and inferences based on a rich background knowledge. The varied reading interests and involvements of the subjects would suggest that the subjects had such a repertoire of knowledge. Both as readers and writers they were able to select appropriate or important language units to help in their refinement of meaning-making. Perhaps it could be expected that selecting language units would be important to both reading and writing because language is the pivot-point between creating and re-creating meaning. Inferencing was important to both readers and writers, perhaps because it is the process that allows one to further refine language units into a more personal meaning. An inference seemed to represent the meaningfulness of a text to a subject much better than either his own words on paper or a selection of words from another author's text.

Some processes were used similarly in reading and writing by virtue of their rarity: using antecedent information, expressing dissonance, drawing conclusions, and revising ideas.

Three other similarities between reading and writing emerged from interviews with subjects. First, they observed that a good reader enjoyed the same aspects of a written product that a good writer must put into it, such as descriptive detail, distinctive characters, humor, and adventurous plots. They chose to write the same types of stories that they read. Second, subjects claimed to use some of the same strategies for dealing with problems of meaning-making in either reading or writing. These included re-reading, using a dictionary, asking for help, and detecting missing words. Finally, and of greatest interest, discoveries and surprises were reported for both reading and writing. From the subjects' explanations, it seemed that surprises while reading were caused by a violation of an existing knowledge schema. Some had notions of a ghost being a white sheet that walks though walls and down stair cases. The ghost in the story violated those notions by falling in clothed pieces down a chimney. Discoveries made while writing seemed to be caused by new connections made between existing schema. One writer connected his schema for a hot air balloon to that of survival needs. He discovered that the torch would make a fire and the balloon cloth could be used as a bed.

Only on four processes did reading and writing appear to differ: predicting, goal-directing, responding affectively and revising. These may help to explain the essential differences between reading and writing.

First, subjects did 12% more predicting while writing than while reading, though on retrospection their prediction for writing was much like that for reading. A writer generates his own ideas from a vast store of knowledge in order to produce a plausible text, while a reader's predictions are constrained or narrowed down by the unfolding text. Thus, it seems reasonable to expect that a writer would do more predicting than a reader. However, as readers, the subjects also asked 8% more questions than they did as writers. It might be argued that questioning is a forward-looking planning strategy like prediction; it was referred to as a predicting strategy by the participating teachers. Of note, sometimes prediction of ideas by writers seemed to occur simultaneously with or be subsumed by the selection of language units, perhaps because of the verbal facility of the subjects.

Goal-directing would seem to be the one process that most distinguished between reading and writing. Colleen was the only subject to use some goal-directing in her reading, but subjects spent an average of 11% of their time goal-directing while writing. Since writing is a production task, it was considered more difficult than reading by the subjects. Thus, goal-directing may need much more conscious attention while writing than while reading. It appeared that goals or changes in goals were the basis for making revisions in writing, while disconfirmations based on further ideas obtained from a text was usually the reason for revising ideas in reading. The conditions of this study may not have been adequate for tapping reading goals.

Responding affectively was another process that distinguished reading from writing for all but one of the subjects. Even on interview, subjects were more reluctant to tell what they thought of their own story than to give an opinion of the ghost story. Furthermore, girls gave more affective responses than did boys. Teaching emphasis and social conventions may have influenced these results. Traditionally, students have been taught literature appreciation--to respond affectively to their reading. Such responses were elicited from students in both grade 6 lessons observed. At the same time, writers have been encouraged to objectify their approach to their writing as this has been considered a sign of maturity in a writer. Too, modesty dictates restraint in praising one's own work, and social convention teaches boys to be more emotionally reserved than girls. However, many of the subjects were proud of stories they had written in the past and indicated that they wrote for their own enjoyment. Perhaps subjects had less time in writing than in reading to spend on thinking about their affective responses because of the attention demanded by writing to prediction, goal-directing and revisons of word choice and mechanics.

Overall, the group tended to spend only about 24% of the time planning for reading compared to about 40% for writing; about 60% of the time refining a model of meaning for reading compared to 44% for writing; and about 16% of the time reviewing during both processes. These results replicate Langer's (1984) findings that readers were more concerned about their meaning construction than were writers, and that writers made more hypotheses and monitored their goals more often than did readers. She also found that readers referred to goals in under 2% of their protocols.

Question 3

> Are different processing styles indicated by differences between subjects in their approaches to reading and writing?

Six of the eight subjects showed reasonably strong similarities between their styles of processing for reading and writing. The three styles that emerged were labelled Inquiring (information- and reason-seeking), Interpretive (analytical of the text read so far), and Predictive (conjecturing, confirming or disconfirming, and revising ideas about what is to come in the text).

Only one subject demonstrated an Inquiring approach to both his reading and writing (Stuart), relying heavily on questioning. However, his reading style did resemble a predictive approach in that he made predictions and confirmed or disconfirmed them. As already mentioned, questioning seems to be a forward-looking strategy like predicting. Stuart also preferred to read and write adventures and mysteries, much like the Predictive group.

The style that best described the connection between Kim's reading and writing processes was the Interpretive approach. She did do a good deal of predicting on the introspection while writing, and used questioning and confirming as her forward-looking approach to reading. Nevertheless, she did a moderate amount of inferencing during both activities, and was the only subject to do more inferencing while writing introspectively than while giving any other type of protocol. Perhaps these observations together with the fact that Kim's written story contained elements of adventure as well as a focus on character traits and emotions, indicate a balanced approach to her processing.

Sue's and Chad's processing, on the other hand, appeared to fit more neatly under the Interpretive label. They both used antecedent information to make sophisticated inferences while reading and writing. For them, selecting language units was somewhat more important than relying on background knowledge. Both used the conflict in their written stories to reveal their characters rather than to develop the action. Unlike the other subjects, they each stated the moral of their stories when asked about their meaning. All three, Sue, Chad and Kim, mentioned writing about children their own age in their stories, and Kim liked to write poetry. Kim and Sue were particularly "people-oriented" in their selection of reading materials (autobiographies, romances, Judy Blume, Norma Klein, and Beverly Cleary), while Chad preferred more adventure.

Subjects who used a Predictive approach included Colleen and Gary, and to a lesser extent Kate and Steven. Colleen, Steven and Gary did the most confirming and disconfirming of the whole group in both the reading and writing sessions; Kate did some only when reading introspectively. While Gary and Chad were the only subjects to revise ideas for reading, Sue, Chad and Stuart revised none of their predictions for writing. In comparison, Kate, Colleen, Steven and Gary all indicated that they revised some of their ideas for writing, and all spent at least 6-10% of their time revising word choices. Their use of antecedent story information while reading was for the purpose of critiqueing the internal consistency of the story (Colleen and Kate found it unsatisfactory) or to justify a prediction (Steven). Only Colleen used antecedent information to ensure the coherence of the story she wrote. However, Colleen and Steven re-read aloud, and Gary was observed to re-read while he wrote.

All of the subjects using a Predictive style wrote action adventures, and preferred to read and write adventures, mysteries, sports stories or science fiction. Kate, Gary, Steven and Stuart each mentioned on interview that predicting or using clues was common to their thinking in reading and writing.

Graves (1975) found that the writers he observed were of two natures, either Reactive or Reflective (see Chapter 2). Ryan (1983) similarly labelled the processing styles observed in the reading and writing of her subjects as Reactive or Transactive. Those using a reactive pattern tended to "report", while those using a transactive pattern tended to have more balanced strategy use. In a broad sense, these styles were replicated respectively by the Interpretive and Predictive or Inquiring styles found here. Whereas the labels used by Graves and Ryan address processing behavior, the labels used in the present study attempt to reflect the aim or attitude behind process selections. It is noteworthy that the Graves' labels, previously used to describe writing styles, could apply to reading.

Use of some processes did not appear to differentiate between subjects according to processing style. All subjects discussed their knowledge sources. All were goal-oriented writers who began with global goals and addressed subgoals as the writing unfolded (as found in the writing subjects of Emig, 1971; Sawkins, 1971; and Stallard, 1972). Selection of language units with which to associate meaning seemed basic to both reading and writing for all subjects. At some point in either reading, writing, or both, all subjects expressed a problem with meaning-making. Girls responded affectively more than did the boys to their reading and writing, though all but one subject responded more strongly to their reading than to their writing.

In summary, each subject did not use a certain set of processes to the exclusion of others, but tended toward a processing style that could be applied to both reading and writing. It should be stressed here that each subject had his or her own individual approach in several respects.

Question 4

> What do sixth graders perceive to be similar and different about their thinking for reading and writing activities?

This question was primarily answered through the final, direct interview question, with additional perceptions inferred from responses to other interview questions.

Only four subjects thought there was a similarity between their thinking when reading and writing. Kate felt that she used clues to make guesses in mystery stories, and had to put clues into her own stories. Sue felt she had to think about the dialogue and descriptions while doing both activities. Gary and Stuart felt that they had to predict what would happen further into the story. When asked about surprises and discoveries in the separate reading and writing interviews, most reported experiencing these during both activities. However, while reading, violations of existing schema seemed to cause surprises while connections between existing schema seemed to be the cause of discoveries in writing. To solve meaning-making problems, subjects often mentioned using the same strategies for reading and writing: re-reading, using a dictionary, asking for help and detecting omitted words.

It appeared to be easier for subjects to explain differences than to explain similarities between reading and writing. Four thought that writing demanded more thinking or decision-making than did reading, which was not hard because it involved someone else's ideas. Kate thought she could use her own interests more in her own writing than when reading. Sue felt that as a writer she knew what would happen next, but as a reader she read to find out. Stuart noted that writing involved an attention to word choice and mechanics that is absent for reading.

Answers to this question seemed to depend on whether the subject had global goals or subgoals of writing in mind. Writers usually had global goals set at the beginning of their writing, thus making it true that they had a sense of what would happen in their stories. Subgoals were more difficult to meet and thus precipitated prediction comparable to that in reading, but also demanded more self-reliance in thinking and decision-making. Reading seemed to be a more automatic process than writing for several subjects who did not like to stop and think at each dot in the ghost story.

Subjects gave elements of story and character development from the ghost story, but global aspects of the story they wrote, as important information. In contrast, when asked for the personal meaning of the stories, they tended to respond globally to the ghost story with a theme, for instance, but with details such as characters' feeling from their own stories. Perhaps it was the investment of time on subgoals while writing, and the aesthetic appeal of discovery at this level, that subjects found personally rewarding.

Limitations of the Findings

Aside from the delimitations set out in Chapter 1, several limitations of the findings became evident as the data were gathered and analyzed.

1. Several subjects provided under 30 clausal units on some protocols. Kim gave a low number on both the introspection and retrospection for reading and for the retrospection after writing; Kate gave only 27 clausal units on the retrospection after writing; and Stuart gave under 20 clausal units for each retrospective protocol. These short protocols would affect the reliability of percentages calculated per process category.

2. There were indications that Stuart's protocols may not have represented his usual processing well.

3. Colleen's recognition of the ghost story used in the reading session may have affected the proportion of processes she used.

4. Goal-directing comments were rare in the reading protocols, perhaps indicating that the study design did not tap this process well for reading.

5. The study design may not have provided adequate opportunity for _reviewing_ processes, so that it was difficult to interpret the relatively small amount of reviewing done for both reading and writing.

Implications

The findings of this research study are discussed below in terms of their implications to the theory paralleling reading and writing, to instruction in Language Arts, and to diagnosis and remedial instruction.

Theory of Reading-Writing Parallels

The findings of this study lend support to Tierney's model presented in Figure 2.2 which parallels reading and writing processes. As readers and as writers, the subjects engaged in some of the same types of planning, refining, and reviewing processes. As a group, the subjects did a greater proportion of planning while writing than they did for reading, and likewise spent more time refining a model of meaning while reading than while writing, but did about the same amount of reviewing for both activities. One of the strengths of Tierney's model is that it does not specify that parallel proportions of processes be used for reading and writing.

Individuals within the group of subjects had distinct processing patterns which most applied to both reading and writing. One subject used an inquiring approach, seeking answers further in the text. Three subjects took an interpretive approach, making inferences based on an analysis of the text. Four subjects took a predictive approach, looking for confirmation of their hypotheses further in the text and revising where necessary. Again, Tierney's model is flexible enough to encompass these individual processing styles.

The study did fail to give sufficient evidence of goal-directing and revising ideas as a reader's planning and reviewing processes, respectively. Perhaps what Tierney's model lacks is a footnote regarding the automaticity of some processes in reading compared to the application of planning and problem-solving strategies in writing at a more conscious level. To the subjects of the study, this seemed to be an important difference between the two activities. It may also be necessary to distinguish between the global goals and the subgoals of writing to show how they are paralleled in reading, and to give an indication of the relative difficulty of meeting subgoals of the two activities.

There was evidence in this study to support the evolution of meaning through recursiveness in both reading and writing. Both induced changes to the knowledge networks of subjects whether by accommodating new information to existing schema (usually in reading), or by forming new connections between schema (usually in writing). Thus, even as writers, subjects "refined a model of meaning" through discovery rather than simply "translating" their thoughts into language. This would support the suggestion in Chapter 2 that Tierney's term could apply to both activities.

As a result of working with the coding system of the study, there would appear to be room for further discussion and definition of the global process, "refining a model of meaning". In some instances, subjects seemed to select language units simultaneously as they predicted (planned) the details of stories they wrote. Perhaps the verbal facility of learners affects the relationship of processes. Too, a reader's selection of language units may be done differently from a writer's. The contention here that "selecting a language unit with which to associate meaning" reflects a refining process should be explored further, especially in the attempt to draw parallels between reading and writing.

Language Arts Instruction

An incidental observation made in the course of analyzing contextual data was that processes used most often by the good readers and writers in this study appeared to be emphasized by teachers in the observed lessons. Both teachers facilitated knowledge mobilization (through brainstorming), prediction, questioning, inferencing, and responding affectively.

The findings of the study support the notion of reading and writing as similar processes. As research discussed in Chapter 2 has shown, raising students' metacognitive awareness of strategies used in reading and writing can result in improved comprehension and writing skills, respectively. It follows that giving conscious attention to the parallels of processes as well as products may help learners to master reading and writing more efficiently. To the extent that many people (including some subjects of this study) admit talking themselves through difficult tasks (Smith, 1982a), it would seem that bringing reading/writing processes to a verbal level of consciousness could be a useful strategy to use with upper elementary students. Applying the think-aloud technique used in this study could be one way to do this. Fitzgerald (1983) suggests that teachers model thinking aloud to develop metacomprehension, and Braun (1984) modelled thinking aloud to teach writing processes in his instructional study. While some subjects in the present study felt that thinking aloud slowed down their reading or got in the way of writing, others reported that it helped them understand the ghost story and helped them to decide what to write.

The approach of the New Hampshire group to making the parallels of reading and writing obvious to learners is supported as well by the findings. They began by giving parallel definitions of reading and writing to first graders (Graves & Hansen, 1983; Hansen, 1983). Both activities were defined as processes of composing a message, and the teaching of both involved placing the responsibility for choice and decision-making on the students.

Smith (1984) would engage children early in "purposeful written language enterprises" (p. 14) in order to make them members of the "club of writers" so that they would also read like writers. He explains:

> Children--like adults--will read stories, poems, and letters differently when they see these texts as things they themselves could produce; they will write vicariously with the author (p. 12).

Like Smith, Calkins' (1986) theme is to make "insiders" of children by giving them control as authors and as reading critics. She echoes Smith with:

> When children see their own writing as the result of human choices and when they work on their own unfinished texts, they view their reading material differently (p. 224).

She claims that the connections between reading and writing processes do not happen automatically, but need to be taught. Journal writing and conferencing as writing activities can be paralleled by journal writing and conferencing as reading activities.

In the same vein, Newkirk (1982) would use conferencing to "drive a wedge between experience and the written text" (p. 456), and thus help both readers and writers to see text as changeable. He wrote:

> Even students who can accomplish the important comprehension tasks such as locating the main idea, summarizing, and drawing inferences are controlled by the written language if they must accept the writing on

> its own terms, if they lack the power to question the integrity of the text before them (p. 457).

Subjects in this study did not use reviewing processes of evaluation and revision to the same extent that they used planning and refining. If indeed some of the child's "power" or "control" as a reader and as a writer lies in reviewing processes, then it would be important to emphasize these processes in teaching paradigms.

Chew (1985) calls for in-process instruction of skills rather than analyzing literature piecemeal and demanding snatches of writing in order to practice isolated skills. He would have students reading and writing longer, complete pieces of discourse. He also describes a general process of reading that could be taught in terms of writing. It consists of "prewriting" (eg. brainstorming, researching, reflecting); "drafting" (eg. understanding the author's purpose, organization, and choice of language); "revision" of predictions and concept schema through summarizing, questioning and evaluating; and "publication" through sharing.

The need to teach processes, rather than focus on content alone, is made more critical by the finding that three quarters of the subjects had individual processing styles that they applied to both the reading and writing activities. It would seem important to allow learners to explore their own styles. By recognizing different processing styles, teachers could facilitate increasingly sophisticated connections between reading and writing. As well, they could encourage students to incorporate elements of other styles into their processing, thus achieving a balance of processes available to students.

Findings about specific processes also have implications for instruction. Discussing global goals and subgoals of reading and writing might help students understand why they often find writing to be more difficult or challenging than reading. The lack of revision of ideas while reading may indicate that students are not very familiar with this as a reading process. Likewise, only one subject did a good deal of spontaneous revision of her predictions in writing, suggesting that children may need to be taught to brainstorm alternatives from which to choose ideas that will meet their subgoals and make their stories interesting and novel. Teachers might also foster a greater aesthetic appeal of the writing process by encouraging positive affective responses to the discovery and creative aspects of writing in-progress.

Because of the differing proportions in which planning and refining processes were used in reading and writing, it is suggested that reading and writing both need to be practiced amply. Teachers should not expect to be able to teach solely in one area and rely on a transfer of processes taught to the other.

Diagnosis and Remedial Instruction

The findings provide some support for the notion that identifying a students' thinking skills could be used to diagnose difficulties of reading and writing as Chaffee (1985) claims. This could be particularly important for assessing writing skills since the processes used on one piece may be more typical of an individual than the quality of a single sample of his or her writing. Furthermore, the use of protocol analysis would be more objective than the holistic judgement of a writing sample. Remedial instruction could then focus on processes that differentiate the learner from good readers and writers. Good readers who are poor writers might particularly benefit from being made aware of their reading processes as they apply to writing.

Suggestions for Future Research

Two areas of future research may be important to instructional practice. First, research into the effects of instruction in one activity on the skills of the other could describe the differences between using content-oriented and process-oriented instruction. Second, if reading and writing processes are to be used in diagnostic and remedial situations, then the processing styles of poor readers and writers need to be described in order to determine processes that differentiate them from good readers and writers.

It would be interesting to explore the effects of different processing styles on preferences for story types. An incidental observation made in this study was that those subjects using an Inferential style tended to read and write stories about children their own age solving realistic problems. Those using an Inquiring or Predictive style tended to prefer to read and write mysteries and action-adventures. On the other hand, perhaps the types of stories they chose to read and write determined the style of processing that they used. This study compared the reading and writing of narratives. Would the processing styles of subjects be different if expository texts were used?

The findings also suggested that the types of schema changes that take place during discovery may be somewhat different for reading and writing. In this study, reading tended to foster accommodation of new information to existing schema, and writing tended to foster new connections between schema. However, this too was an incidental observation made on the basis of a small number of subjects' interview responses after specific reading and writing activities. Further investigation would be necessary before any conclusions could be drawn.

The design of a similar study in the future could be altered to yield more valid and reliable findings. First, it would be desirable to use a subject sample size that would permit findings to be reported with statistical confidence. Second, a design could be created to better reveal whether or not goal-directing is important to reading and revising to writing. The task environment for reading may have to specify goals, the think-aloud directions could include a specific direction to tell about goal-directing, or an interview question could be devised to tap goal-setting. The task environment for writing could be more like that for a class assignment where opportunity for revision is evident to the participants. Third, it is strongly recommended that practice and target writing sessions not be done together as this was apparently tiring for some subjects.

Closing Comments

Although generalizations from this research project are limited by the sample size, the findings lend support to theoretical discussions paralleling reading and writing processes. As well, specific considerations for further discussion arise from the results. The study served to emphasize that reading and writing are complex processes influenced by numerous factors, so that much variation between individuals in their approaches to the two activities can be expected.

Good teachers are sensitive to such differences in their students, adjusting their teaching accordingly to challenge their students towards growth. They use analogy in their lessons to maximize efficiency in the transfer of learning from one situation to another, from one discipline to another, and now from one language arts area to another. The process-oriented philosophy of teaching Language Arts is an exciting one. It is a child-centered approach that has generated new teaching paradigms. Good teachers have intuitively addressed processes even within traditional paradigms, and studies such as this one help to explain why they have been so effective.

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APPENDICES

APPENDIX A

PURPOSE OF THE STUDY

I am doing a study at the university. I want to find out how sixth graders read and write stories.

You were selected for this study because you did well on a test you wrote last year. Your teacher also thought you were a good reader and writer who would be willing to help me. Is that all right with you?

This study will not affect your grades in any way.

I will not be finished with this study until May. I would like to ask you not to talk about this with other sixth graders until that time so they won't know what to expect if I have some of them help me, too. (Adapted from Olshavsky, 1975, p. 181.)

I will read you some directions. I will read them because I want them to be exactly the same for everybody. Here they are: (From Olson, 1979, p. 57.)

APPENDIX B

READING SESSION DIRECTIONS

1. You will be given a story to read silently.
2. While you are reading the story, I want you to talk about the things that are going through your mind. You may stop to think aloud whenever you can, but do stop at each red dot to talk about what you were thinking as you read that part of the story.
3. Read and talk as though you were alone. Take your time.
4. I will be taking notes of what you say, but since I might miss something important, I am going to tape record you so I can listen to it again later.
5. Are there any questions?
6. Here is a story for you to practice with. You may begin now.
7. [After reading practice story] I would like you to go back over the story and tell me all you can remember about what it made you think about, how it made you feel, and any decisions you had to make and how you made them.

Break--Informal Interview

8. Now please read this story [target story] in the same way. Remember to take you time.

(Adapted from Olshavsky, 1975, p. 183, & Olson, 1979, p. 57.)

APPENDIX C

WRITING SESSION DIRECTIONS

1. I am going to ask you to write a story for me--one that you think kids your age would enjoy. I will suggest three topics to you, but you may write about anything you wish.

2. While you are making up you story, I want you to talk to yourself. Speak the things that are going through your mind as you plan and write the story.

3. Write and talk as though you were alone.

4. I will be taking notes of what you say, but since I might miss something important, I am going to tape record you so I can listen to it again later.

5. Are there any questions?

6. You will have 20 minutes to practice talking while you write. When the timer goes off, you'll know you should be wrapping up your story. Here is a topic: Treasure in the Attic [on paper].

7. [After writing practice story] I would like you to go back over the story and tell me all you can remember about what it made you think about, how you planned and made up the story, and any decisions you had to make and how you made them.

Break--Informal Interview

8. Here are the three topics. Remember that you can make up you own topic if you wish. You have about 40 minutes so take you time.

Follow-up Interview

(Adapted from Nolan, 1978, p. 34.)

APPENDIX D

STORIES USED IN THE READING SESSION

Practice Story

Confusing Colours *

Sometimes Larry got tired of his handicap. It wasn't a serious one - not like being deaf, or having to use a wheelchair. But it was a nuisance.* Larry had trouble telling which colours were which. He wished he could see colours the way other people saw them. At school some of the kids, particularly Brad Baxter, played tricks on him, getting him mixed up.*

Every morning before school, Larry's mother inspected his clothes to make sure he looked all right. If she didn't, he might go out wearing an orange sweater and blue slacks with one red sock and one green. That morning was the same as usual.*

"Please, Larry, be careful to think about the colours you're wearing. You don't want to look like a clown."

Larry laughed. "It's not important, Mom. The only colours that matter are my football colours. I never get my football clothes wrong. They're the team colours."*

That day at school, when the class began making designs, the teacher was delighted with his work.

"Larry, you really have talent," she said, putting his work on display.*

Brad Baxter punched him on the way out of class and teased him, saying, "You've got talent, eh? Let's see some talent this afternoon when we play against the Raiders."*

Larry laughed. "No problem, Brad! How many goals do you want me to get? All of them?"

"Think you're smart!" Brad growled. "All you need to do is remember the combinations. I'll get the goals."*

After school, Larry was late getting to the lockers to change. The coach yelled at him and Brad shouted, "Snap it up, stupid! No time to fool around!"*

Larry was delayed longer when he found someone had been in his locker. His football socks were missing. There was a pair of strange socks instead of his own.* He wasn't sure what colour they were, but they didn't have the same texture as his own socks and he wasn't going to wear them.* Everyone would laugh if he ran onto the field in the Raiders' colours instead of his own! Larry wondered who wanted to thrick him. He felt confused. He began to change.*

Brad Baxter pounded down the hall and burst into the locker room. As he flung Larry's socks at him, Brad had a guilty look on his face.*

Somebody switched your socks on you!" he said, scooping up the other socks. "You'd look silly in the Raiders' colours. Don't stand there staring at me! Hurry up, man! We need you."*

That afternoon Larry and Brad teamed up as they never had before to win the game. Larry was sure Brad had decided never to play tricks on him again.*

* Placement of red dot.

Story from Courtney et al. (1980). Language Development Reading: Evaluation Resource Book for Northern Lights and Fireflies (pp. 18-19). Scarborough: Nelson.

Target Story

The Tinker and the Ghost*

Long ago, in a village in Spain there stood a deserted castle. Although there was no one inside it, strange moaning sounds echoed through the halls.* A few brave adventurers had gone into the castle. But in every case they had been found the next day sitting lifeless in front of the fireplace.*

One day there came to the village a brave and jolly tinker. He earned a few pennies in the market place fixing pots and pans. He heard about the haunted castle and decided to investigate the strange sounds and sights.*

"If you go into the castle," said one of the old villagers, "you will never come out alive."

"I fear nothing," said the tinker. "I will sleep in the castle tonight and keep this dismal ghost company."*

Everyone was amazed. They told him of the reward offered by the owners of the castle to anyone who banished the ghost.*

The tinker got ready for the night. He picked out a good frying pan, collected a bundle of sticks, and bought some bacon, fresh eggs, and wine. He made his way into the pitch-dark and musty castle. He started a fire in the huge stone fireplace and warmed himself on the hearth.*

Soon he had slices of bacon sizzling in the pan over the fire. Just as he lifted his flask to drink some wine he heard a thin, sad moaning voice. "Oh me, oh me," it wailed.*

"This ghost is not too cheerful," said the tinker, "but it doesn't frighten me." He cracked some eggs into the pan.*

"I'm falling," shrieked the ghost.

"Don't fall into the frying pan," answered the tinker.*

There was a thump! Down the chimney came a piece of the ghost. It was a leg clothed in half a pair of trousers. The tinker put it aside and continued his cooking.*

"Look out," roared the voice. And down the chimney came the other leg.

There was another thump and the torso and arms of a man clothed in a leather jacket landed on the hearth. The tinker went on eating and cooking.*

The voice thundered, "Look out, I'm falling." Down the chimney tumbled a head.

"Will you join me in a meal?" said the tinker.*

"No, thank you," said the ghost, who was now standing all in one piece by the fire. "You have helped me already. None of the others stayed around long enough for me to get my body together. Now help me take off these clothes."*

The tinker did so, and the ghost disappeared. All that was left was a pile of clothes on the ground. The tinker went back to town to tell his story and claim his reward.*

* Placement of red dot.

Story from Courtney et al. (1980). Language Development Reading: Evaluation Resource Book for Sleeping Bags and Flying Machines (pp. 18-19). Scarborough: Nelson.

APPENDIX E

FOLLOW-UP INTERVIEW QUESTIONS

Session 1 and 2

1. I would like you to look back over the story. Read it to me and tell me all you can remember about how you planned and made up the story/thought and felt as you read the story. Try to go back over what you were thinking at different times. You may add anything you didn't say before.
2. Is there anything else that the story made you think about?
3. [Writing Session:] Tell me about the idea for your story and where it came from.
4. Tell me how the story makes you feel. What does it mean to you? How did it come to have this meaning? Think about it.
5. What information was important to you? Why?
6. Did anything about the story surprise you or feel like a "discovery"? That is, did you learn or find anything that you didn't expect or didn't know before? Explain.
7. Did the story work out the way you expected or wanted it to? Explain.
8. What do you do when something doesn't make sense?
9. Do you usually read/write stories the way you did this one? Explain.

10. What do you think of the story that you read/wrote? [Writing session:] How does it rate against the best story you have ever written?

11. What do you think makes a good story? [Writing session:] What things go into writing a good story? [Reading session:] What things make a story good to read?

Session 2

12. Compare the thinking that you usually do while reading to the thinking that you do while writing. Do you do any thinking for reading that is like your thinking for writing? Explain. Are there any ways that you think differently?

APPENDIX F

TEACHER INTERVIEW QUESTIONS

Regarding Subject Participation in the Study

1. Here are the stories that ______ wrote for the study. How do these pieces compare with the writing he/she usually does in school?
2. How would you describe this student as a writer? Does he/she write often? What is the typical length of the writing? topic or type of story? concern about writing? time spent on a piece?
3. How would you describe this student as a reader? How much does he/she read? What type of stories does he/she read?
4. Could you comment on the student's performance in other academic areas?
5. Are there any other factors which you consider may be relevant to an understanding of the child, particularly with respect to his/her reading and writing performance?

Adapted from Nolan (1978, pp. 369-370).

Regarding Language Arts Programming

1. Your description of your Language Arts program.

2. Your objectives: what you feel are the most important things to teach sixth graders in Language Arts.

3. Routine activities, some typical activities.

4. Student responses to these activities (ie. attitudes, improvements).

5. Ideas that are discussed about good reading materials and good writing. Specific terminology that is taught.

6. Texts and supplementary texts used in Language Arts; how texts are regularly used.

7. How and when the library is used.

8. Classroom arrangement during Language Arts.

9. Out-of-class resources used (eg. guests).

10. Types of reading and writing required or focussed on; your preferences, if any.

11. How Language Arts fits into a typical day: the amount of time spent per week or per day on reading and on writing.

12. Organization of the program over the year.

APPENDIX G

GROUP MEANS AND STANDARD DEVIATION TABLES

Table G-1

Group Means for Mobilizing Knowledge

Subject	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Kim	0.0	7.1	4.4	25.0
Kate	2.7	12.8	2.0	11.1
Sue	1.7	11.6	0.0	8.1
Colleen	38.3	4.7	1.1	14.4
Steven	3.7	14.3	3.5	42.8
Chad	0.0	2.4	1.2	20.2
Gary	0.0	0.0	0.0	5.7
Stuart	0.0	14.3	1.9	11.1
M	5.8	8.4	1.8	17.3
SD	12.4	5.3	1.5	11.3

Note. All values represent percentages.
Intro. = introspective data.
Retro. = retrospective data.

Table G-2
Group Means for Predicting

Subject	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Kim	0.0	7.1	45.6	12.5
Kate	13.5	20.5	63.3	7.4
Sue	3.4	0.0	15.4	0.0
Colleen	8.5	0.0	16.8	19.2
Steven	3.7	16.7	9.9	0.0
Chad	4.8	4.9	46.4	0.0
Gary	3.1	21.9	17.7	11.3
Stuart	10.0	0.0	3.7	11.1
M	5.9	8.9	27.4	7.7
SD	4.1	8.8	20.0	6.7

Note. All values represent percentages.
Intro. = introspective data.
Retro. = retrospective data.

Table G-3
Group Means for Goal-directing

Subject	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Kim	0.0	0.0	10.3	12.5
Kate	0.0	0.0	14.3	14.8
Sue	0.0	0.0	16.9	10.8
Colleen	0.0	4.7	12.3	17.3
Steven	0.0	0.0	5.8	1.0
Chad	0.0	0.0	7.1	5.6
Gary	0.0	0.0	1.6	24.5
Stuart	0.0	0.0	11.3	16.7
M	0.0	.6	9.9	12.9
SD	0.0	1.6	4.6	6.8

Note. All values represent percentages.
Intro. = introspective data.
Retro. = retrospective data.

Table G-4
Group Means for Questioning

Subject	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Kim	38.9	7.2	0.0	0.0
Kate	2.7	10.3	0.0	0.0
Sue	0.0	0.0	0.0	0.0
Colleen	0.0	0.0	.7	1.0
Steven	3.7	1.2	3.5	0.0
Chad	0.0	0.0	0.0	0.0
Gary	0.0	0.0	0.0	0.0
Stuart	46.7	42.9	1.9	55.5
_M_	11.5	7.7	.8	7.1
_SD_	18.2	13.8	1.2	18.3

Note. All values represent percentages.
Intro. = introspective data.
Retro. = retrospective data.

Table G-5
Group Means for Selecting Language Units

Subject	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Kim	5.5	14.3	8.8	37.5
Kate	32.5	15.4	8.2	44.5
Sue	29.3	46.5	26.2	37.9
Colleen	23.4	34.9	33.0	17.3
Steven	53.6	42.9	49.4	44.8
Chad	63.9	51.2	3.6	33.7
Gary	92.2	56.2	64.5	32.1
Stuart	23.3	35.7	56.6	0.0
_M_	40.5	37.1	31.3	31.0
_SD_	26.0	14.5	22.1	14.2

Note. All values represent percentages.
Intro. = introspective data.
Retro. = retrospective data.

Table G-6
Group Means: Selecting Antecedent Language Units

Subject	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Kim	0.0	0.0	0.0	0.0
Kate	2.7	2.6	0.0	0.0
Sue	8.6	0.0	3.1	0.0
Colleen	6.4	2.3	1.8	0.0
Steven	1.2	1.2	0.0	0.0
Chad	1.2	3.3	1.2	0.0
Gary	0.0	0.0	0.0	0.0
Stuart	0.0	0.0	0.0	0.0
M	2.5	1.2	.8	0.0
SD	3.1	1.3	1.1	0.0

Note. All values represent percentages.
Intro. = introspective data.
Retro. = retrospective data.

Table G-7
Group Means for Inferencing

Subject	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Kim	16.6	21.4	22.1	6.3
Kate	24.3	23.0	4.1	18.5
Sue	46.6	34.9	36.9	18.9
Colleen	6.4	27.9	.7	5.8
Steven	17.1	4.7	2.9	5.7
Chad	14.5	29.3	21.4	34.8
Gary	4.7	4.7	6.5	15.1
Stuart	10.0	0.0	0.0	0.0
M	17.5	18.2	11.8	13.1
SD	12.5	12.4	12.5	10.4

Note. All values represent percentages.
Intro. = introspective data.
Retro. = retrospective data.

Table G-8
Group Means for Expressing Dissonance

Subject	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Kim	5.6	0.0	0.0	0.0
Kate	2.7	2.6	0.0	0.0
Sue	3.5	0.0	0.0	0.0
Colleen	0.0	4.6	.3	3.8
Steven	0.0	0.0	1.2	1.9
Chad	2.4	1.6	1.2	2.3
Gary	0.0	0.0	0.0	1.9
Stuart	0.0	0.0	3.8	5.6
M	1.8	1.1	.8	1.9
SD	2.0	1.6	1.2	1.9

Note. All values represent percentages.
Intro. = introspective data.
Retro. = retrospective data.

Table G-9
Group Means for Drawing Conclusions

Subject	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Kim	5.6	7.2	1.5	0.0
Kate	2.7	0.0	0.0	0.0
Sue	3.4	2.3	0.0	0.0
Colleen	6.4	2.3	10.9	11.6
Steven	7.3	10.6	5.8	0.0
Chad	4.8	4.9	1.2	1.1
Gary	0.0	9.4	0.0	5.6
Stuart	10.0	7.1	0.0	0.0
M	5.0	5.5	2.4	2.3
SD	2.9	3.5	3.7	4.0

Note. All values represent percentages.
Intro. = introspective data.
Retro. = retrospective data.

Table G-10
Group Means for Responding Affectively

Subject	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Kim	27.8	35.7	0.0	0.0
Kate	16.2	12.8	0.0	3.7
Sue	3.5	4.7	0.0	21.6
Colleen	10.6	18.6	3.9	5.7
Steven	8.5	6.0	0.0	1.0
Chad	7.2	.8	1.2	2.3
Gary	0.0	0.0	0.0	0.0
Stuart	0.0	0.0	0.0	0.0
M	9.2	9.8	.6	4.3
SD	8.7	11.6	1.3	6.8

Note. All values represent percentages.
Intro. = introspective data.
Retro. = retrospective data.

Table G-11
Group Means for Revising Ideas

Subject	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Kim	0.0	0.0	0.0	6.2
Kate	0.0	0.0	2.0	0.0
Sue	0.0	0.0	0.0	0.0
Colleen	0.0	0.0	4.2	2.9
Steven	0.0	0.0	1.2	1.0
Chad	1.2	.8	0.0	0.0
Gary	0.0	7.8	0.0	3.8
Stuart	0.0	0.0	0.0	0.0
M	.1	1.1	.9	1.7
SD	.4	2.6	1.4	2.2

Note. All values represent percentages.
Intro. = introspective data.
Retro. = retrospective data.

Table G-12
Group Means for Revising Word Choice

Subject	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Kim	0.0	0.0	1.5	0.0
Kate	0.0	0.0	6.1	0.0
Sue	0.0	0.0	1.5	2.7
Colleen	0.0	0.0	8.4	1.0
Steven	1.2	2.4	10.5	1.0
Chad	0.0	.8	1.2	0.0
Gary	0.0	0.0	8.1	0.0
Stuart	0.0	0.0	3.8	0.0
M	.1	.4	5.1	.6
SD	.4	.8	3.4	.9

Note. All values represent percentages.
Intro. = introspective data.
Retro. = retrospective data.

Table G-13
Group Means for Revising Mechanics

Subject	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Kim	0.0	0.0	5.8	0.0
Kate	0.0	0.0	0.0	0.0
Sue	0.0	0.0	0.0	0.0
Colleen	0.0	0.0	2.1	0.0
Steven	0.0	0.0	3.5	1.0
Chad	0.0	0.0	14.3	0.0
Gary	0.0	0.0	1.6	0.0
Stuart	0.0	0.0	0.0	0.0
M	0.0	0.0	3.4	.1
SD	0.0	0.0	4.5	.3

Note. All values represent percentages.
Intro. = introspective data.
Retro. = retrospective data.

Table G-14
Group Means for Re-reading

Subject	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Kim	0.0	0.0	0.0	0.0
Kate	0.0	0.0	0.0	0.0
Sue	0.0	0.0	0.0	0.0
Colleen	0.0	0.0	3.9	0.0
Steven	0.0	0.0	2.9	0.0
Chad	0.0	0.0	0.0	0.0
Gary	0.0	0.0	0.0	0.0
Stuart	0.0	0.0	17.0	0.0
M	0.0	0.0	3.0	0.0
SD	0.0	0.0	5.5	0.0

Note. All values represent percentages.
Intro. = introspective data.
Retro. = retrospective data.

Table G-15
Group Means for Planning Processes

Subject	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Kim	38.9	21.4	60.3	50.0
Kate	18.9	43.6	79.6	33.3
Sue	5.1	11.6	32.3	18.9
Colleen	46.8	9.4	30.9	51.9
Steven	11.1	32.2	22.7	43.8
Chad	4.8	7.3	54.7	25.8
Gary	3.1	21.9	19.3	41.5
Stuart	56.7	57.2	18.8	94.4
M	23.2	25.6	39.8	45.0
SD	19.9	16.5	21.0	21.5

Note. All values represent percentages.
Intro. = introspective data.
Retro. = retrospective data.

Table G-16
Group Means for Refining Processes

Subject	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Kim	22.1	35.7	30.9	43.8
Kate	59.5	41.0	12.3	63.0
Sue	84.5	81.4	66.2	56.8
Colleen	36.2	65.1	35.5	23.1
Steven	71.9	48.8	52.3	50.5
Chad	79.6	83.8	26.2	68.5
Gary	96.9	60.9	71.0	47.2
Stuart	33.3	35.7	56.6	0.0
M	60.5	56.5	43.9	44.1
SD	25.5	18.1	19.4	21.1

Note. All values represent percentages.
Intro. = introspective data.
Retro. = retrospective data.

Table G-17
Group Means for Reviewing Processes

Subject	Reading Intro.	Reading Retro.	Writing Intro.	Writing Retro.
Kim	39.0	42.9	8.8	6.2
Kate	21.6	15.4	8.1	3.7
Sue	10.4	7.0	1.5	24.3
Colleen	17.0	25.5	33.7	25.0
Steven	17.0	19.0	25.1	5.9
Chad	15.6	8.9	19.1	5.7
Gary	0.0	17.2	9.7	11.3
Stuart	10.0	7.1	24.6	5.6
M	16.3	17.9	16.3	11.0
SD	10.5	11.2	10.3	8.2

Note. All values represent percentages.
Intro. = introspective data.
Retro. = retrospective data.